

ACCOUNTING FOR
EXECUTIVE CONTROL

ACCOUNTING FOR EXECUTIVE CONTROL

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ACCOUNTING FOR EXECUTIVE CONTROL

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To
R. M. H.

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FOREWORD

THE need of a fact-gathering agency for the use of management has long been recognized. Practical means for so doing have been available, for the most part, only since the development of mechanical devices of various kinds. It is not strange, therefore, that the organization of a fact-finding bureau or agency within a business has been of comparatively recent growth. Probably the outstanding recent development in the field of internal business organization has been what might be termed controllership organization. Once the means of fact finding and reporting became available, the development of a technique to handle and care for them was a logical sequence. In those business organizations where this technique has been worked out, these activities have usually been headed up in a controller's office, which thus becomes an agency for collecting, summarizing, reporting and interpreting the factual data needed for the determination of proper policies and their execution.

The accounting office has always been the place where most of the significant financial facts of business have been recorded. To expand its field of activity and function, under the direction of a controller, to include the gathering and preparation of data, not strictly financial but almost equally significant and important, is in accord with the best modern practice, which makes use of an established agency with a personnel already trained, rather than building up a new with the possibility of a duplication. Thus controllership organization has been developed and has proved itself worthy of its trust.

This is the central theme of this book, Accounting for Executive Control, and the author has developed his theme in a logical and methodical way. First he develops the end and aim of management, then the concept of accounting; next what is meant by an adequate control of business activities on the part of management. After this he treats of the facilities or agencies necessary and available for management control, and after establishing controllership, or accounting in the more recently accepted sense, as such an agency, he shows the services which accounting can make available to the various execu-

tives—chief and subordinate—on whom rests the management of a business enterprise. Viewing business functionally, he points out the nature of the factual data needed by financial procurement, marketing and personnel managers and their assistants, and shows how the controller's office should be a clearing house for all this information. Nor does he neglect to indicate how the controller's office should itself be organized to carry on and accomplish its manifold duties and services. The whole treatment is set forth against a comprehensive knowledge of broad and basic economic law.

Not the least interesting and valuable part of the book is the section, Chapters XXVI–XXXII, where is given a practical illustration of the working out of the principles of organization and operation advocated, through the medium of the Mileage Tire Co., in which the figures and data used are very close to actualities.

I am very glad to commend this book to the earnest student of business organization and management as the most complete and comprehensive portrayal of the methods of controllership organization and some indication of its possibilities and value. It should also be an excellent guide to executives in knowing what they have a right to expect in the way of service from the controller's office.

ROY B. KESTER

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P R E F A C E

THE science of management has made much progress during the past decade but the science of accounting has not kept pace with it. The development in the science of management has made necessary a restatement of the purposes of accounting. If accounting is to serve management best it must accomplish the purpose of all science—that of prediction. In doing this, consideration must be given to the past, the present, and the probable future. In planning future operations for the business enterprise the accounting instruments will best serve management if they state such operations in terms of a definite organization in which the cross currents of authority and responsibility are at a minimum. In accomplishing this aim it has been necessary to bring the various tools to play upon the problems of management. The development of the treatise is from the standpoint of the organization of a sizable business.

The subject is indeed timely for the following reasons:

In the first place, the treatises on accounting are chiefly from the public accountant's point of view. They deal with the past and are interested chiefly in the statement of the financial operations and financial conditions of the business as of a past date. The principal management problems of an enterprise must be stated in terms of an organization and the future, if the best results are to be secured.

In the second place, there is need for definite planning of operations so as to earn a profit—which is the prime aim of business—and this can be done best where well-devised plans are made in advance of operations, based upon prudent business policies. The tendency to specialize in various phases of management has led to the development of a literature in specialized fields, and this makes it exceedingly hard for the student as well as the business man to see the close interrelation of the various specializations and to get a perspective of the field as a whole. A work which definitely ties the various phases of management to the accounting methods should serve a timely need of business students and business men.

In the third place, in modern organizations the placement of authority and responsibility is exceedingly lax, and one of the principal

remedies for this leach of business profits is that of definite knowledge of what work "should be" accomplished, the progress of the work, any causes for variations, and proper executive action thereon.

In the fourth place, there are a large number of schools and colleges which offer courses in engineering and business subjects, and the author hopes that this book will assist in giving the students in these courses a broader viewpoint of accounting than is obtained from many of the books upon the subject.

This volume is the result of the author's research and study of management problems as they are attacked in manufacturing and commercial concerns. Some eight months were required to make over eighty planned interviews and the inspection of plants which are reputed to be well managed. Since the field covered is broad, the works of many authorities had to be digested. The treatment of the material had to be restricted so that the subject as a whole could be properly coordinated. Certain phases of the practice of management are much ahead of the material covered in technical magazines. Many helpful suggestions have been given by business men who are too busy to develop their thoughts properly and give them publicity.

An idea of how the problems assayed for the purpose of this book were attacked may be interesting. In Part I the problems dealt with are stated. In doing this it was necessary to state what the science of management is, how it was and is being developed. The ideas of accounting were then treated. Since accounting can serve management best only when the purposes of accounting are in agreement with the purposes of management, it was necessary to provide ways and means whereby the aims of management and accounting would be parallel. Since management is concerned largely with the future it was necessary to state that accounting should give consideration to the future. In order that this may be done best it is necessary to state the accounts in terms of a suitable organization.

How this organization could be developed is treated in Part II. The treatment traces the line of authority and responsibility to the chief executive. Since the chief executive is a leader and not a "doer" he must have an organization to lead. It was observed that in order to do the work of the concern best it is necessary to have: (1) standards for the guidance of the administrators, the managers, and the other personnel of the organization; (2) records to provide information regarding performance, and (3) reports to interpret performance and forecast the future.

Part III deals with the questions of standards and records and shows how the administrators, the chief executive, and the other executives are supplied with the information which they require for the conduct of the business.

An analysis of the various phases of management led to a treatise on three major phases of management: namely, marketing, procurement, and labor.

How the Manager of Marketing, the Sales Manager, and the Publicity Manager are supplied with, and how they use accounting information is dealt with in Part IV. Since the functions of publicity and sales overlap, it is necessary to have a manager in charge of the broad phase of these fields to coordinate them properly. Then, too, the organization becomes too complex where the chief executive has too many executives reporting to him. A manager in charge of each broad function, such as marketing, procurement, labor, and standards and records is deemed to be essential for proper organization. The marketing forecast must serve as an important instrument for the control of a business enterprise; thus, emphasis is placed upon the necessity for research and analysis as the basis for standards in marketing. The importance of standards is not generally recognized. This treatise emphasizes that standards may be established and results appraised.

Part V outlines the ways and means for securing procurement control. As in marketing management, the several functions of management in procurement are coordinated by a manager. Procurement has been divided into two phases: production and facilitation. The latter phase of management is to coordinate the various functions which may be necessary at many places throughout the organization but which require centralization in order to be effective. The purchase and store functions are illustrative. The general principle holds true that the work should be done where the minimum of cross currents of authority and responsibility are present. Since many of the functions of a business enterprise overlap, it is impossible to say just where the work should be done, except in connection with a given organization. The treatise on procurement control assays the broader phases of the subject and stresses the importance of standards and records as the basis for control.

In Part VI the problems of labor control are treated. The broad function is under the direction of a Manager of Personnel. For purposes of treatment, the functions of labor control were further divided into employment and training. The principal ways in which

accounting can be used for the control of labor are dealt with, and emphasis is placed upon the scientific method as the basis for the attack of problems in this field. The need for standards and records is emphasized, and some ways and means are stated for making them effective as tools of executive control.

Coordinate with many other problems of internal management are such external problems as the proper relations to the business cycle, proper relations with stockholders, the investing, and general public. These problems are treated in Part VII. Chapter XXIII is largely of an introductory nature for the chapters which follow.

Much of the illustrative material which is deemed essential to reinforce the statements of principles is treated in Chapters XXIV to XXXI inclusive. Illustrative material in Parts IV, V, and VI was held to a minimum and Chapters 24 to 31 inclusive made to furnish the necessary illustrations. These present major and master budgets and performance reports for a sizable business. In doing this, consideration is given to external conditions as they are related to internal conditions. The budgets of 1926 were measured, in quarterly periods with performance and significant causes for variations determined. In the forecast for the first quarter of 1927, consideration was given to these variations as they might affect operations during the coming quarter. This is illustrative of the application of the science of accounting as an aid to executive control.

From the methods of procedure employed in gathering the materials for this treatise it will appear evident that the author has incurred many obligations. He is indebted to his friend and teacher, Dr. Roy B. Kester, Professor of Accounting, School of Business, Columbia University, for suggesting the subject and for giving much valuable assistance and general criticism of the work; to A. H. Stockder, Assistant Professor of Business Organization, School of Business, Columbia University, for his criticism of the chapters on business organization; to Frederick C. Mills, Professor of Statistics, School of Business, Columbia University, for his criticism of the chapters on business statistics; to H. Parker Willis, Professor of Banking, School of Business, Columbia University, for his criticism of Chapter X, and to Dr. Harlow S. Person, Managing Director of the Taylor Society, for his general criticism of the work. He is indebted also to a large number of managers, administrators, organizations, and professional men, who showed a spirit of professional interest in the work. In many cases, several members of an organization rendered valuable

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CHAPTER I

THE MANAGEMENT

Three Types of Management.—Before it can be known how accounting can be an aid to management, something of the nature and the function of management must be understood. To give the term “management” more than a generally misunderstood meaning some distinctions must be made.

The term “management” may readily be divided into three types, as follows:

1. Unsystematic management.
2. Systematic management.
3. Scientific management.¹

Unsystematic management, as the term well describes, means that those who control the enterprise have no regular way of doing their job. This type of management operates mainly through intuition, and is often referred to as the “hunch” method. Despite its popularity, only a passing word can be devoted to it here, because accounting information is of little value where such management is practiced.

Systematic management provides ways for doing things. Regularity and conformity to “system” is honestly striven for here. The philosophy of this kind of management is not new. Its practice today is far-flung. To this type of management, accounting is deeply indebted for its development.

The philosophy of “scientific management” is not so easy to explain or to understand as the two former types of the term “management.” Frederick W. Taylor is credited with being the instigator and proponent of “scientific management.” Many writers and critics have done much to obscure the real philosophy of Taylor by quoting pas-

¹H. P. Kendall, *Bulletin of the Taylor Society*, Vol. VIII, No. 5.

sages that were not comprehensive of the concept. Much of this misunderstanding is undoubtedly due to the inherent nature of the task of trying to make a somewhat complex philosophy simple. Especially is this true in the light of Taylor's limited expression and lack of critical editorial assistance. The following quotations, however, may serve as a basis for development:

Scientific management consists of certain broad general principles, a certain philosophy, which can be applied in many ways, and a description of what any one man or men may believe to be the best mechanism for applying these general principles should, in no way confuse the principles themselves.¹

The four elements of "scientific management" are: "(1) The development of a true science. (2) The scientific selection of workmen.² (3) His scientific education and development. (4) Intimate friendly cooperation between the management and the men."

Another statement is: "Scientific management . . . does, however, involve a certain combination of elements which has not existed in the past—namely, old knowledge so collected, analyzed, grouped, and classified into laws and rules that it constitutes a science; accompanied by a complete change in the mental attitude of the workingmen as well as of those on the side of management, towards each other, and towards their respective duties and responsibilities. . . . It is no single element, but rather this whole combination, that constitutes scientific management which may be summarized as follows: (1) Science, not rule of thumb. (2) Harmony, not discord. (3) Cooperation, not individualism. (4) Maximum output, in the place of restricted output. (5) The development of each man to his greatest efficiency and prosperity."³

A briefer statement of Taylor's philosophy of management appears in the following: "Scientific management cannot be said to exist, then, in an establishment until after this change has taken place in the mental attitude of both the management and the men, both as to their duty to cooperate in producing the largest possible surplus and as to the necessity for substituting exact scientific knowledge for opinions or the old rule of thumb or individual knowledge."⁴

There are two requisites to Taylor's philosophy of "scientific management." They are:

- (1) Complete cooperation between management and employees.
- (2) Scientific knowledge utilized to take the place of individual knowledge.

It must be readily conceded that any amount of science cannot

¹ *The Principles of Scientific Management*, p. 28.

² *Ibid.*, p. 130.

³ *Ibid.*, p. 139.

⁴ H. Res. 90, Vol. III, pp. 1377-1508, reprint in the *Taylor Society Bulletin*, Vol. XI, Nos. 3 and 4, reference p. 104.

secure cooperation; the securing of cooperation is an art. Facts may be secured by the scientific method but the application of those facts to a business problem is an art.

We require, then, a distinction between the Science of Management and Scientific Management. The Science of Management is that body of scientific knowledge of managerial facts which can be used as a trustworthy guide in the future. Scientific knowledge is secured by means of the scientific method.¹ Scientific Management is very different. It includes "the science of management," the "function" of management, and a philosophy of management. "Everything he (Taylor) did is clearly definable as either science or management or the function of management, and these should be distinguished from his philosophy or state of mind."²

Dr. H. S. Person has restated the principles which Taylor advocated in the following words:

1. *Research and Experiment.* The discovery by investigation and experiment of a factual basis for every determination of purpose, policy, program, product, material, machine, tool, method, type of ability and skill, and other factors in the conduct of an enterprise.

2. *Standards.* The expression of the results of research and experiment through defined and published standards, which serve as common goals, facilities, or methods, conceived in the best interest of economy and welfare, for those cooperating in the enterprise.

3. *Control.* The establishment of a systematic procedure for the execution of work based on the defined and maintained standards; a procedure which facilitates each specialized effort and coordinates all specialized efforts, to the end that the common objectives may be achieved with a minimum of waste of human and material energies and with a maximum of human welfare and contentment.

4. *Cooperation.* The recognition of the natural laws of cooperation involving the integration of individual interests and desires with group interests and desires and of individual capacities with the requirements of group purposes; the substitution of the laws of situations for individual authority, guess and whim; and the recognition and capitalization of human differences, motives, desires, and capacities in promotion of common purpose.³

Development of the Science of Management.—Already a sufficient body of scientific facts has been gathered about managerial problems to make possible broad generalizations in not a few phases of the work. In a recent paper read before The Taylor Society, Mr.

¹ See Jones, *The Administration of Industrial Enterprises*, pp. 5-7.

² Williams, John H., *Bulletin of the Taylor Society*, Vol. IX, No. 2, p. 66 (April, 1924).

³ *Scientific Management in American Industry*, pp. 10, 11. Harper Bros.

L. P. Alford presented over forty of these "laws." The number of these "laws" or principles will be extended when the scientific method is applied to more managerial problems. That a science of management is being developed and is capable of being extended is evident from a cursory knowledge of what has been and is being done in the field of management. In the formulation of a science of management, accounting, in the sense which it will be used in this book, will be an aid to the solution of many problems.

Management Defined.—The term "management," in practical usage, covers a wide scope. It would include the formulation of, and the execution of "policy." In a somewhat more technical sense it may be differentiated into: (1) Administration, (2) Management, and (3) Organization. Oliver Sheldon says of these:

Administration is the function in industry concerned in the determination of the corporate policy, the coordination of finance, production, and distribution, the settlement of the compass of the organization, and the ultimate control of the executive.

Management proper is the function in industry concerned in the execution of policy, within the limits set up by administration, and the employment of the organization for the particular objects set before it.

Organization is the process of so combining the work which individuals or groups have to perform with the faculties necessary for its execution that the duties, so formed, provide the best channels for the efficient, systematic, positive, and coordinated application of the available effort.¹

For clearness in the use of the term "management," the distinction here set forth will be followed in this book.

The administration of the affairs of a corporation is usually left to a board of directors. The wisdom used by this board in the conduct of its function has much to do with the success of the corporation; but it has been found by experience that "if you want to get things done, do not leave them to a committee." The execution of work is, then, left to management.

The management of the affairs of a business requires the services of men whom we call executives. An executive is one who "controls" the actual performance of work. This concept of the executive is subject to two interpretations. One is, that an executive is one who has "control" over the work of another. This means that one has control of the work of another because the right has been vested in him by one who has authority to do certain things.

¹ *The Philosophy of Management*, p. 32.

A foreman, for example, is an executive because he has received certain authority from another, and has certain control over another's work. The second interpretation is that an executive is one who executes or does work. The operator of a lathe, for example, is not a machine. He has some of the nature of an executive, since the intelligent operation of the lathe requires knowledge, skill, and a certain amount of judgment. In this book the word "executive" will be used in the first sense. Executives are of different ranks. The rank or type of work that each does is frequently indicated by descriptive words. The management of the affairs of a concern is usually divided along broad functional lines. This means that some one is in charge of such major functions as: finance, marketing, procurement, and personnel. These major functions may be broken down into the component functions. This analysis may extend to particular jobs, no matter how small.

In the development of a topic of this kind it is necessary to present it in one "plane"; whereas, the subject is a concrete whole—a "solid." Let us return again to the general consideration of management.

Management is Composed of Three Branches.—Management, in its most generally accepted sense, is composed of three branches which may be divided as follows:

I	II	III
Owners	Men	General
Managers	(workers)	Public

We may recognize three types of government in business as well as in constitutional government. In business, the people, the general public, the customers and prospective customers, form what is known in our form of government as the judicial corps. In order for a business to be a success, other factors eliminated, it must adjust itself to its environment; the public is the ultimate source for financial success.

The representatives of the owners, or the board of directors in the corporate form of organization, direct the policies of the business. They legislate and direct. The executive function is usually vested in a president. He is "responsible" for the execution of policies, so the saying goes.

At this point, this treatise will deal largely with the legislative and executive functions from the point of view of the corporate enterprise. The terminology used will follow the distinctions previously

made. The legislative function relates to administration; the executive function relates to management.

Ultimate Authority Rests with the Stockholders.—Under our present corporate form of ownership, the ultimate internal authority is vested in the stockholders. The stockholders vest periodic control in the board of directors, which, in well-managed corporations, have as their function the “making of policies” and “passing upon results obtained.” The “making of policies” and “passing upon results obtained” is, of course, subject to wide differences in point of view as to just what these statements mean. The viewpoint held by the author will be elaborated at different points in the systematic discussion of the subject. The general concept is stated below.

The policy corps, or board of directors, is the outgrowth of centuries of development in ownership organization procedure. The legal status of a director has likewise undergone gradual development. The ethical factor has no doubt been in the lead in this development. Today, in corporations that have a reputation for good administration, the practice of the board of directors is far ahead of the legal concept of their duties and responsibilities.

The Principles of Administration and Management.—There are certain principles underlying the scientific approach to the solution of administrative and managerial problems. For the purposes of control, the greatest of these are as follows:

(1) Before the accomplishment of any “work” is undertaken an evaluation of results to be obtained should be made. Means should be provided whereby it may be known what results are being and have been obtained, together with causes for variation between evaluated results and actual accomplishment. This principle may be stated with a different emphasis, as follows: A person who has authority to do that which he does not actually perform himself should, before the work is started, evaluate or have evaluated the results to be obtained. Means should be provided by which he may know that his “orders” are executed. If the evaluation is different from the results obtained, he should know the causes for variation.

This principle involves the following three steps:

- (a) Predetermination of results, or the setting of a standard.
- (b) Performance, or accomplishment.
- (c) Causes for variation between standard and accomplishment.

(2) From the principle set forth above we may formulate a concept of efficiency. Mr. Taylor set forth this concept of efficiency when he measured the relation between standards and accomplishment. "Standards" may change. Efficiency is, therefore, relative. But because efficiency is a relative term there is no reason why it cannot be effectively used in the conduct of a business enterprise. Efficiency may be scientifically determined.

(3) The first principle is fundamental, but requires for its effective use the fixing of responsibility and authority. Mr. Gantt said that: "The authority to issue an order involves the responsibility to see that it is properly executed."¹ He also said that: "Authority and responsibility for performance must be centered in the same individual."² Mr. Alford said that: "Responsibility for the execution of work must be accompanied by the authority to control and direct the means for doing the work."³

The fixing of authority and responsibility is difficult in most cases, if one's concept of the subject be comprehensive. In modern business, authority to control and direct the means for doing work does not make one "responsible" for something over which he has not "actual" control, even though his authority may be broad enough. Gantt recognized this when he, for example, set up his Idleness Chart. Here he gives causes for idleness, some of which are controllable, while others are not.⁴ Each of these principles requires further elaboration, a part of which is given below, while much must be left for discussion in subsequent chapters. There are many mechanisms for securing control but these should not be confused with the principles themselves. From the viewpoint of the author, the foregoing principles serve as a basis for the control of a business.

The Policy Corps.—In the light of the foregoing analyses let us see how the principles set forth affect the policy corps. The policy corps is a legislative body. It would, indeed, be a poor policy corps or board of directors, which made policies without adequate scientific knowledge upon which to base their judgment as to the probable results that could be expected from certain policies which they propose to establish. This is not intended to convey the idea that even a large majority of the successful concerns today are so well favored with facts upon which to make decisions, for they are not. Books could be

¹ *Industrial Leadership*, p. 8.

² *Organization for Work*, p. 78.

³ *Laws of Manufacturing Management*, p. 13.

⁴ Clark, *The Gantt Chart*, p. 30.

written about the shortcomings of the data upon which boards of directors make decisions, but what we think is most needed is to show what information is desirable in the conduct of a business enterprise, and to show how control can be secured best.

Possibly the base of this whole question is that of authority and of responsibility. What concept do the members of the board have of their duties and responsibilities? Do they take their jobs seriously or do they take them lightly? Do they demand facts upon which to make decisions, or do they prefer to use their own rule-of-thumb knowledge in the matter? Do they have an admirable ethical concept, or do they hide behind the letter of the law? The philosophy of the members of the board in their interpretation of authority and of responsibility will materially affect their actions in the administration of the affairs of the corporation.

Let us assume that the administrators and managers of the business have accepted the foregoing principles of control. This will lead to a systematic discussion of these principles of control. It is a demonstrated fact that many businesses are started which never succeed financially. In many cases a simple analysis of the facts would have indicated that few chances of success, if any, were possible. This same thing applies to all classes of businesses, to a greater or a lesser degree. This would indicate the necessity of well-drawn plans for action. The truth of this has come down to us through many centuries. It is forcefully expressed today in the modern budget, which is more adequately discussed in Chapter XII, but to which some attention will here be directed.

The Budget.—From the point of view of the policy corps, the modern business budget provides a means for the expression of the evaluation of results to be obtained. It is a plan for action in the future, the general orders for the chief executive. There are many methods of setting up the budget but these should not overshadow the foregoing principles. These principles should be kept clearly in mind in this discourse. The "final" authority and responsibility, within the means of their control, rests upon the board of directors. The sources from which they may secure facts are broad, both from within and from without the business. The facts they may secure are limited only by their own resourcefulness and ability, together with the resourcefulness and ability of their employees and of those with whom they are associated. The fact that the board of directors does not "execute," is a feature which should be ever present in the formu-

lation of the budget. The budget as approved by the board of directors, when properly interpreted, is a standard of attainment. By the side of this standard is to be placed achievement. By means of an interpretation of the causes for variation it is possible to judge whether or not the policies of the concern were wisely made, and whether or not they were properly executed.

The Executive Corps.—The policy corps delegates to the chief of the executive corps the authority necessary to carry out the policies they have made for the business. In him is centered the authority and responsibility to execute the general orders—the budget. Much misunderstanding can be avoided by a better understanding of what is meant by “authority” and “responsibility.” Some administrators use the words interchangeably; some prefer never to use the former.¹ In present-day practice there are two distinct viewpoints as to the meaning of “authority” and “responsibility.” They may be labeled (1) “legal” authority and responsibility, and (2) “technical” or “operating” authority and responsibility. There are other distinctions not pertinent to this discussion. The above distinctions require further analysis.

The legal phase of authority and responsibility is the outgrowth of our legal procedure in general. The viewpoint here developed is that of the corporation which is organized and operated in conformity to law. The legal status of corporations which are chartered under general corporate laws is, for the most part, well defined at present. This is likewise true of those who are associated with the corporation in the capacity of stockholders, directors, or other officials. According to the legal concept, “authority” means that the corporation has, through a properly constituted body, received from the state the legal right to do certain things; it is authorized by law to pursue a given course in its business affairs. The state likewise exercises a certain control over the corporation; it is held responsible for certain of its acts. The “responsibility” of a corporate enterprise is, in many ways, definite. A corporation has no authority to violate law; and if, for example, it violates the Sherman Anti-Trust Law the state may hold it responsible. This responsibility is not a fiction, as not a few corporations have felt the consequences of this responsibility.

It is quite logical that since the corporation has received certain “authority” and thereby acquired certain “responsibilities,” that it, in turn, has a right to “fix” authority and responsibility upon its duly

¹ Bulletin of the Taylor Society, Vol. XI, No. 5, pp. 254-255.

appointed representatives. From this practice our present procedure has been evolved. The stockholders elect the board of directors, which in turn elects the president. The board of directors receives certain legal rights or authority and thereby acquires certain responsibilities. This is likewise true throughout a corporate organization. The stockholders have "original" authority; they have "final" authority. Of course "final" authority cannot here be construed to mean that the stockholders as such decide everything. Likewise, the executives of all ranks cannot make "final" decision on every question. This is where the confusion arises.

The operating phase of authority and responsibility is likewise an outgrowth of legal procedure, but which today appears to be far removed from its original source. It is inherent in the performance of any piece of work, that the one who does the job has all the authority necessary to do the job. This assumes, of course, that the performer is duly authorized, or legally authorized, to do the job. He likewise incurs certain responsibilities. The nature and extent of these responsibilities are covered by the general principle set forth above. Such responsibility must be within the authority and "control" of the performer.

The truth of the "operating" concept of authority and responsibility has long been, consciously or unconsciously, recognized in business. Gantt, for example, fully recognized it.¹ The great difficulty in the understanding of this subject seems to be that the accepted form of organization "delegates" to certain individuals duties which never were expected to be performed fully by them. Likewise, the placing of "full responsibility" in such a case was not expected. There is a great temptation to interpret the question too narrowly; not to see it in the light of "all the facts and circumstances." The interpretation of authority and responsibility solely from a "legal" or from an "operating" point of view leads into a dilemma. For example, "the dispatch clerk has more authority in dispatching work than the president."² From the "operating point of view," generally, this is true. It must be remembered, however, that the dispatch clerk and his work are directly or indirectly, as the case may be, under the supervision of the president. Authority, from the "legal point of view," is derived from the owners, and it would be silly for a dispatch clerk to perform his work in any manner at variance with any general or special order

¹ See page 7.

² Bulletin of the Taylor Society, Vol. XI, No. 5, p. 243.

which the president or any "superior" may direct. Strict interpretation of this question from either of the points of view would make it impossible*to operate a modern business under that interpretation. This leads to different phases of this same problem which will now be taken up.

Authority and Responsibility.—The effective placing of authority and responsibility is a great problem, the importance of which is not generally realized. This involves, among other things, the question of proper organization. In the conduct of a sizable business, the organization of the executive corps along broad functional lines may be

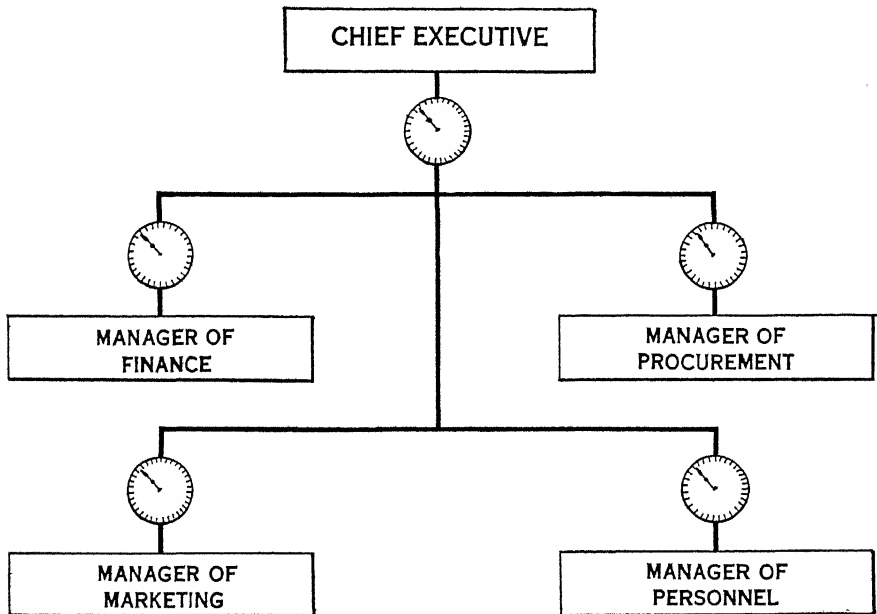


Figure 1. The Organization Chart of the Executive Corps Along Broad Functional Lines.

represented by Figure 1. The duties and responsibilities of each of these executives is sketched below, together with certain limitations that may be placed upon their work. Further development of this subject will be found in various parts of this book.

The Chief Executive.—In most large corporations, the chief executive is a "specialist" of "specialists." His corporation is a user of "all" the sciences and the arts. Obviously he cannot have very much specialized knowledge covering so wide a field; therefore he becomes a specialist of specialists, who in turn are specialists of specialists. All this means that today the chief executive in a sizable

concern is in a different situation from that of the chief executive of a small concern. In the large concern the chief executive finds himself with few decisions to make; in the smaller concern, many petty decisions of the same nature "must" be made repeatedly. The chief executive in the large firm must relieve himself of practically all details. In fact, it has been found that by relieving the chief executive from the necessity of making decisions that could be centralized in a specialist in that particular line, better results could be obtained. The decisions are more effectively made and the chief executive has time to devote to more important matters.

In a recent address, Mr. H. P. Kendall¹ said:

I think that the successful heads of business today are doing less and less on major decisions—approving them but assuming less and less authority and responsibility—but doing more and more in the field of manning their organizations strongly and in the creative or inspirational field. Of course without enthusiasm, without team work—and team work means cross coordination of departments—without that the business cannot, in the terms of a battle, be fought as a whole.

Possibly the major problem of the chief executive is the "fixing" of authority and responsibility. In fact, this is "the" problem of administrators and executives. It starts at the "top" of the organization and continues to the "bottom" of it. The principles for the "fixing" of authority and responsibility have already been stated.² The technique and mechanisms necessary for the accomplishment of this task is beyond the scope of the present discussion, but occupies a prominent place throughout this book.

The Manager of Finance.—The question of "finance" has for a long time occupied a prominent place in the conduct of business. With the growth in the size of concerns many other questions have required much attention, but the finance question has lost none of its importance. In fact, it has become increasingly more complicated. Today the capital structure of many concerns is extremely complex. This means that the manager of finance has to deal with many problems which heretofore did not exist. Profits have in many cases become so complex that they are determined by "fair estimates." The many liabilities of the business must be properly dealt with. Capital requirements must be planned and assured long before the funds will be required to make payments. To accomplish these, together with other

¹ Bulletin of the Taylor Society, Vol. XI, No. 5, p. 252.

² See pp. 6-7.

tasks, the Manager of Finance must be assisted in many ways. He becomes a specialist of specialists.

The above is intended to be but a broad idea of the task of the manager of finance. Further development of this subject is to be found in Chapter VIII.

The Manager of Marketing.—With the growth in the practice of large-scale manufacture, mass production, and other modern business practices has come the problem of finding a market for, and the profitably marketing of goods. Wider markets had to be secured to dispose of the products. To accomplish the desired results new methods were necessary. This called for the services of specialists, so that today in a sizable concern the supervision and coordination of the work of these specialists requires the services of a specialist of the specialists. This functionary is here designated as the Manager of Marketing.

The general nature of the function of marketing may be indicated by two words: "publicity" and "selling." Chapters XIV to XVI, inclusive, deal more fully with this subject.

The Manager of Procurement.—Modern manufacture has brought many vexing problems of its own. To cope with these problems successfully much specialization of the executive function has been necessary.

The function of procurement in a manufacturing concern has to do with purchases and manufacturing. In a modern business combination, for economical management some one must fill the function of "head" or "coordinator" of these broad functions. These functions have to do with the acquisition of material and its fabrication. The performer of this function has been designated as the Manager of Procurement. A more elaborate analysis of this function and the underlying functions will be found in Part V of this book.

The Manager of Personnel.—The nature of the work performed by personnel specialists has to do, in a broad sense, with the "hiring" and "training" of the employees. Not all of the personnel "function" can be performed by the personnel department. This is true likewise throughout the whole organization. The personnel department has, however, tended to broaden its scope of activity. The scientific approach to the personnel problem has demonstrated that while the "management of men" is an art, it is in many cases a crude art which cannot be effectively used. As the commercial and industrial situation grows more and more complex, the fine art of "man man-

agement" requires more and more scientific knowledge to guide its activities in the performance of its function.

Other Functional Executives.—The broad outline of the organization of the executive corps of a sizable concern has been set forth. Something of the nature and limitations of the work of each of the major executives or managers has been indicated. It should be fully understood, however, that their task has to do mainly with coordination and control. It was pointed out that each major executive in the corps requires the services of other executives, who in turn require the services of others. The object of such a treatment of this subject is to show clearly the "line of authority" and to lay a basis for the effective placing of responsibility.

For the development of this subject it is not necessary or desirable to undertake to show the duties and responsibilities of every kind of functional executive. It may be well, however, to enumerate some of these, and leave to other chapters the task of analyzing these functions. They are:

- Manager of Manufacture,
- Manager of Facilitation,
- Manager of Publicity,
- Manager of Selling,
- Manager of Training,
- Manager of Hiring (employment),
- Manager of Department A, etc.,
- Foremen of various kinds.

The objection may be raised that the basis of the foregoing analysis is arbitrary; that it involves a classification that has been assumed. This, to some extent, may be true.

CHAPTER II

CONCEPTS OF ACCOUNTING

Introduction.—In the previous chapter some indication of the general nature of “management” was set forth. This chapter will deal with several concepts of the nature and scope of accounting. The nature of the task undertaken by the “accountant,” and his point of view as to how he may “best serve management,” are the dominant factors in each philosophy. These factors must be thoroughly understood in order to know how the accountant will react to certain situations.

Financial and Cost Accounting.—Accounting is sometimes divided into two main classes, which are:

1. Financial accounting.
2. Cost accounting.

Most of the books on accounting may readily be grouped under one of these two headings. There is a good reason for this double classification. It may easily be traced to its origin. Here we find that the original species were very different. Financial accounting is a “relative” of financial bookkeeping but the lineage runs through some four centuries. The public accountant and the financier first developed financial accounting while the engineer is credited with first realizing the value of cost information.¹

The first work on double entry bookkeeping² was published in 1494. It explained the Italian method of keeping accounts at that time.³ Accounting, in anything like a modern form, is thought to have had its origin since the year 1915,⁴ and the background is set forth in the writings of W. M. Cole⁵ and H. R. Hatfield.⁶

¹ F. W. Taylor is credited by F. B. Copley in his biography of Frederick W. Taylor, Vol. I, Book IV, Chapter III, with cost accounts that tied into the general books.

² Luca Paciolo, *Summa de Arithematica*.

³ John B. Geijsbeek, *Ancient Double Entry Bookkeeping*. See also his bibliography.

⁴ Professor Kester believes that about 1915 may be used for this date. The introduction of mechanical appliances assisted materially in the preparation of the necessary information.

⁵ *Accounts, Their Construction and Interpretation*, 1908.

⁶ *Modern Accounting*, 1909.

What is believed to be the first book which deals with cost-keeping was published in 1832 by Charles Babbage.¹ It was, however, some fifty years before the subject attracted the attention of manufacturers enough to cause them to undertake to keep individual costs. As manufacturing became more extended and competition became really effective, the subject of cost-keeping grew more and more important. Today it is a subject in which much interest is being manifested.

In order to understand the different concepts of the function and use of "accounting," it is necessary to make an analysis of the two main divisions of "accounting," as stated above. The historical development of each "accounting" concept would be interesting, but for the sake of brevity this is not undertaken.

A Concept of Financial Accounting.—As pointed out above, the practice of keeping books by double entry is not new, but this cannot be said of "accounting." The term "financial accounting" is used to differentiate and describe the offspring of the original type of "accounting." It is now recognized that "financial accounting" is only one phase of "accounting." A striking illustration as to the recent development of "accounting" is that of a comptroller of a large and for some twenty years a prosperous concern (about 1860-1880). This comptroller was reputed to be the most outstanding accountant of England and was in much demand as a speaker on the subject of "accounting," etc. Business reverses were undergone by the corporation for a period of about six years. Finally, while the comptroller was away from business on a speaking engagement, the directors of the corporation agreed that the concern was hopelessly bankrupt. When the comptroller returned and found his concern was in receivership he was as much surprised as the general public, even though an analysis of the statements which he prepared showed that the concern had gone from bad to worse, and finally into insolvency. This case emphasizes the fact that the "old bookkeeper" had no idea of what we now consider "accounting" to be.

The philosophy of "financial accounting" is the outgrowth of double entry bookkeeping. For an understanding of this phase of "accounting" it may be well to take the work of Henry R. Hatfield, *Modern Accounting*,² as the basis for development. He tells us that:

The essence of accounting is the presentation, first, of a correct exhibit of the financial status of the concern at a given moment of time, and, secondly,

¹ *Economy of Manufacture*.

² Published in 1909, quotations from 1919 printing.

a showing of the results obtained during a given period of time. The first is embodied in the Balance Sheet; the second in the Income or Profit and Loss statement.¹

This has been called "proprietorship accounting" because so much emphasis is laid upon the proprietary interest in the statement.

This type of accounting proposes to deal with "facts" that have taken place. Its great concern is "how" to present correctly these facts at any given time and how to keep track of the "facts" during the interim in order to "secure the concern against the loss which might arise from forgetfulness, carelessness, or dishonesty."² The big problem is "how" to set up "properly" the balance sheet. The balance sheet is set up in two sections, as follows:

$$\text{Goods} = \text{Proprietorship}^3$$

The Goods accounts make record of the various items of wealth positive and negative, showing all the assets and liabilities. But the other set, consisting of the original Proprietorship and the Profit and Loss account, serve to exhibit the amount of capital invested at the beginning of the period and the gain or loss accruing during that period.⁴

The question of valuation is a very important one in setting up a "proper" balance sheet. Hatfield says of this:

The three rules of appraisal of general application are: (1) the value to be taken in the inventory is not the liquidation value, but that to a going concern; (2) changes in market value of fixed assets may be ignored; (3) depreciation must always be taken into account.⁵

These three rules have been amplified into something like the following: (1) the "inventory" should be valued at "cost" or "market," whichever is lower; (2) other assets should be valued at cost, less a "reasonable" allowance for depreciation, depletion, obsolescence, or other reserves for deterioration. The above are broad statements of a philosophy of valuation. The application of the rules of valuation to particular assets, liabilities, and net worth items consumes much of the space and energy that Hatfield devotes to accounting. It is beyond the scope of this discussion to undertake a detailed statement of the

¹ *Ibid.*, p. v.

² *Ibid.*, p. v.

³ Origin in 1830 attributed to Thomas Jones of New York.

⁴ *Ibid.*, p. 9.

⁵ *Ibid.*, p. 83.

principles of valuation.¹ The object has been to state the philosophy of Hatfield in a broad way.

A Second Concept of Accounting.—A second concept and a somewhat different philosophy, if we may be allowed to judge in point of emphasis, is that of Cole.² This concept of the function of accounting would accept the philosophy of the balance sheet and relative profit and loss statement as a part of its work. But in these modern days (about 1890–1908) of business trusts and combinations, so narrow a concept of the function of accounting causes many failures. It is, therefore, necessary, according to Cole, to:

. . . distinguish between capital and income. It is quite as important for future guidance to know the comparative profitableness of various enterprises as to know their combined earnings or cost.³ The average business man does not know what things cost him.⁴

Emphasis is placed upon the desirability of keeping costs so as to obtain unit, departmental, or other divisional results in terms of profits. This is an enlarged concept of the function of accounting, a shift in emphasis to meet the needs of business. It should be noted that Cole published his work in 1908 and Hatfield in 1909. It should also be observed that Hatfield considers the question of cost accounting, but it does not occupy such a central place in his "accounting" as costs do in the "accounting" to which Cole aspires.

A further shift in emphasis was brought about by changes in the business structure. This concept would acknowledge the usefulness of the two foregoing philosophies, but would question the validity of so great an emphasis placed upon the "proprietary" interest. In this concept of the function of accounting "an attempt has been made to state the theory of accounting in terms of the needs and purposes of all the equities in the enterprise rather than from the standpoint of any particular interest."⁵ This emphasis upon the "equities" of the business makes a definite attempt to analyze the transactions of a business so that the economic and legal status of those who furnish the business with "capital" and "credit" will be set forth clearly.

From the foregoing and other considerations, it appears that "financial accounting" is an outgrowth of double entry bookkeeping

¹ See Hatfield, Kester, Cole, Paton, for a fuller discussion.

² W. M. Cole, *Accounts, Their Construction and Interpretation*, 1908.

³ *Ibid.*, p. 3.

⁴ *Ibid.*, p. 1.

⁵ Paton and Stevenson, *Principles of Accounting*, 1918, p. 7.

and that the other concepts of accounting are based to a considerable extent upon bookkeeping. How, then, are accounting and bookkeeping to be distinguished? Cole says, that:

. . . perhaps the easiest way of stating the difference between bookkeeping and accounting is to say that the purpose of bookkeeping is to show debts, both those due by the owner of a business and those due to him, and the purpose of accounting is to show profits, losses, and valuation. . . . Good accounting will show as nearly as possible the cost and the return from every application of force and from every change of method—in service, as in mercantile affairs, and in transportation, or in production, as in a factory.¹

This kind of distinction is made by many authors and practicing accountants, but it is doubtful if there is any such distinction "except in popular parlance."²

The interdependence of accounting and bookkeeping may be brought out by the definition of accounting given by Paton. He says that:

Accounting, in a broad sense, is the science which attempts to present and classify the statistics of the "properties" and "property rights" in the business enterprise. All valuable considerations coming into the possession of a business concern should be accounted for, and the rights which various individuals and interests have in the business must be protected. To accomplish this, more or less statistical records are usually necessary.³

The three concepts of the function of "accounting" given above have much in common. The great questions they try to answer are: (1) How can the assets, liabilities, and net worth of a concern best be stated at a given point of time in the past? (2) How are the changes in the status of the business to be set forth? (3) What use can management make of the data secured from the information that may be obtained from past transactions?

The first question deals with what we have called "financial accounting." The balance sheet is usually defined as a statement which shows the financial position of a concern at a given time. It should be stated, however, that the balance sheet may be used for other purposes, as explained later. The second question may also relate to "financial accounting," as it shows some explanation of financial changes. Changes in financial position may be obtained by other methods, so that the profit and loss statement is of less importance for this purpose than the balance sheet. The third question, while important

¹ *Ibid.*, p. 83.

² Kester, Roy B., *Accounting, Theory and Practice*, p. v.

³ Paton and Stevenson, *Principles of Accounting*, p. 1.

from many points of view, has not been in the past considered necessary for "financial accounting." Next in point of development to "financial accounting" is "cost" or "factory accounting," to which some attention will now be given.

Cost-Keeping—Cost-keeping began to attract the attention of factory managers about fifty years ago. The philosophy underlying the development of this concept of the nature and function of cost-keeping may be set forth as follows: To find the "cost" of anything, all you have to do is to find out the amount (of money) expended for labor, materials, and overhead in its production. This type of cost-keeping has been dubbed "post-mortem," because no one knows what the "cost" will probably be until "after" the work is complete and the cost-keeping department has had time to "figure the cost" by methods peculiar to itself. This type of cost-keeping grew up, it seems, with the professional accountants as its chief sponsors.

The cause for the professional accountant's interest in cost accounting was the necessity for properly stating the value of the inventory. In setting up the balance sheet of a manufacturing concern the accountant is faced with the question of "how to value the inventory." Of course the "financial position" of a manufacturing business cannot be known until the value of the inventories is known, other questions being eliminated. This caused the accountants much concern. The solution to the problem, from the "financial accounting" standpoint, was reached by methods especially devised to ascertain the "value" of inventories at any given time. Briefly, this method consisted in keeping an account—or accounts sometimes—with "labor," "materials," and "overhead." When it was desired to "close the books" or to determine the "financial position" of the firm, the plant was usually closed until a list of all goods—"finished," "in-process," and "raw materials"—was made, and the estimated cost of the labor and materials was listed. The factory was then started and the task of "placing a value" upon the inventory and "closing the books" was begun in earnest. Usually, after a period of one to three or more months, depending upon the size of the business and the office force, the manager was presented with a statement of his "financial condition," etc. The accountant prided himself upon the "actual facts" which he had presented to the management. A better insight into the nature of the procedure followed by the accountant may be found in Chapter IX.

Later, the factory manager wished to know the "cost" of individual items. He had to quote prices in advance of manufacture. It was

quite logical for the factory manager to seek an "estimate of cost" from the "head bookkeeper," after he had not succeeded in the task himself. Mr. Howard Coonley¹ states that after estimating the direct labor and materials, his "ex-thread-counter clerk" and he decided that they would add 35 per cent for overhead, but in order to play safe, 50 per cent was added. "Rough" estimates were a very general practice. After this procedure was followed for a number of years, the plant manager who was making little or no profit began to wonder why he was not making profits. To locate the trouble a "real" cost system was installed by "financial accountants." The data secured by the "factory cost system" soon "showed" much inefficiency in the factory. The plant manager wanted to know of the production manager why his costs were so high. The plant manager felt that the "facts" showed conclusively that the production manager was not doing his job properly, but he could not remedy the situation very much. The production manager was not satisfied to know that costs were what the cost system showed them to be. He denied the validity of the statements of cost, or if he did not do this, he merely ignored them. Out of the chaos which this situation created, a different philosophy of cost was developed.

Predetermined Cost.—The philosophy of predetermined costs may be characterized by the expression "standard costs." If costs are to be of "real value" to administrators and managers, an appraisal or predetermination of what things "should cost" must be made. By such a predetermination standard costs may be set. To make standard costs effective the following should be observed: As the work progresses, if "possible," and soon after completion of the work, the results must be known. Such results must be in terms of the estimate and the reasons for variation stated.

There are three men who have been instrumental in developing the philosophy and some of the ways and the means of standard costs. They are: Harrington Emerson, H. L. Gantt, and G. Charter Harrison. A brief reference will be made to each of these authors.²

Emerson³ approached the question of records from a strictly engineering viewpoint. His sixth principle of efficiency is: "Reliable, immediate, adequate, and permanent records." He says:

¹ President, The Walworth Manufacturing Company, Yearbook, National Association of Cost Accountants, 1926, p. 30.

² It should be said that F. W. Taylor greatly influenced each of these writers with his philosophy of cost accounting.

³ *Twelve Principles of Efficiency*, 1911.

The object of records is to annihilate time, to bring back the past, to look into the future, to annihilate space.¹ In the great industrial plants one knows not whether to marvel most at the absence of reliable, immediate, and accurate records, or at the superabundance of permanent records, collected with painstaking and at great expense, but neither reliable, immediate, nor adequate.²

The fault which he finds with the "cost records" is that they are mere "financial" histories without much use in the future conduct of the business. What he was most interested in was how to use the records to better plant operations; so he advocated the setting of "standard costs," against which he measured "actual cost," and by dividing the latter into the former the efficiency in operation could be found.

This process is carried on so as to obtain the following:

Items	Standard		Actual		Efficiency in	
	Quantity	Price	Quantity	Price	Quantity	Price
Material.....	weight	\$	weight	\$	'	'
Wage time	hours	\$	hours	\$	'	'
Amount of wages	"	\$	"	\$	'	'
Time for equipment. ...	"	\$	"	\$	'	'

From the information obtained by this sort of cost analysis, it is possible to develop cost formulæ. This procedure was a great improvement in cost philosophy and procedure but not a complete step, as will appear later, because it did not set forth clearly the "causes" for variation, and "tie-in" the general books and records.

Mr. Gantt³ was probably a better critic of "cost accounting" than any previous writer. A few quotations from his published work will throw some light upon his philosophy and methods. After stating that the cost systems installed by professional accountants were for the use of financiers and that they gave little usable information to the factory, he says:

One of the prime functions of cost-keeping is to enable the superintendent to know whether or not he is doing the work he is responsible for as economically as possible, a function which is ignored in the majority of cost systems now in general use.⁴

In commenting upon the United States as an industrial nation, Gantt lamented the fact that we lacked "complete knowledge of the principles on which successful industry is based. Too many of our

¹ *Ibid.*, p. 206.

² *Ibid.*, p. 208.

³ H. L. Gantt, *Organization for Work*.

⁴ *Ibid.*, p. 32.

enterprises are still founded upon what has been done rather than on what can be done. The real industrial leader must be guided by future possibilities rather than past performances." This last sentence is the key to Gantt's philosophy of cost accounting. He wanted to know what "could" be done, but his greatest contribution to cost accounting was possibly the showing of "causes" for variation between what "should be" and what "is." Cost records to him were an abomination if they did not show "why" costs varied, and this should be done so as to show the factory manager the causes for variation in order that he may make "actual cost" equal to the "standard cost." To him records were of more value in the conduct of a business than mere "financial histories" that did not speak the truth. To him, records were to be used to help solve the problems first hand. They were to be used to point out the real weaknesses in a given situation and to offer constructive criticism in the solution of certain management problems. This philosophy, while important in connection with factory cost-keeping, finds much wider application. It will occupy a very prominent part in this book, and in the development of the science of management and the art of management based upon that science.

Another great contribution of Gantt to cost accounting is to be found in his concept of "overhead distribution."¹ The professional accountant had developed methods of "overhead distribution" which appeared absurd to Gantt. No "cost," the accountants held, could be stated until after the books had been duly closed. The "overhead" could then be "distributed" and "individual costs" could be found. The methods of "distributing overhead" usually gave no consideration to factory operating conditions. Even when the accountant undertook to compute costs before "overhead" was "exactly" known, he did it on a flat percentage basis, or some other basis often equally as unsatisfactory to the engineer.

The accountants' method of "distributing overhead" was repulsive to the engineering type of mind. Gantt distributed "burden" or "overhead costs" on a "normal capacity" basis. If the plant was operating below capacity he reduced prices in order to get orders, but if the plant was operating at capacity he raised prices. This was done by varying the "overhead distribution" to jobs on the basis of different operating conditions. This concept of overhead distribution has

¹ Mr. Carl G. Barth in the December, 1926, meetings of the Taylor Society said that Taylor used this method of expense distribution, but Taylor did not write anything about cost-keeping. Atkins, in his *Cost Accounting for Executives*, says that Taylor distributed overhead on the basis of direct labor.

become prominent and has been advocated by some writers who otherwise favor "post-mortem" cost accounting.

It seemed quite logical that the accountants would eventually be influenced by this cost philosophy of the engineers. Mr. Harrison¹ was so influenced and undertook to adopt it to "cost accounting to aid production." The engineers had no training in bookkeeping and "financial accounting" methods. No attempt had been made to tie-in the factory cost system with financial books. This led to records that had no cross-purpose. Speaking from a cost-accounting standpoint, the manufacturer was subjected to "one of three masters": (1) He was subjected to a cost system which was based upon the then professional accountants' concept, (2) or upon that of the engineer, (3) or upon that of the large majority of manufacturers who had none. Mr. Harrison worked out means and methods by which the engineer's concept of the function of cost accounting could be embodied in the general accounting records of the manufacturer. It now appears that the engineer's concept of cost accounting is to supersede that of the professional accountant who approached the subject from the "financial accounting" point of view.

An extended analysis of the function, design, and use of cost accounting procedure is to be found in Chapters IX, X, and XI.

Public and Private Accounting.—The development of accounting concepts, and ways and means of rendering service, has been along two main lines of thought which are indicated below. The "public accountant," in quest of a "true" statement of the financial condition of a manufacturing business, developed a concept of cost accounting which fitted into his philosophy of accounting. A body of literature has been built up around this philosophy, and today the "professional accountant" is recognized in several capacities by many business men. The philosophy of the "public accountant" has been built up by writers who are recognized by the "public accountants." "Financial accounting" and "cost accounting" to them are phases of a larger subject which they prefer to call "accounting." Due to the character, concept, and the use to which all kinds of "accounting" information may be put, it seems quite essential that we recognize two separate and distinct divisions in accounting work. These divisions may be stated briefly, as follows:

- (1) The concept of accounting from the public accountant's point of view.

¹ G. C. Harrison, *Cost Accounting to Aid Production*, 1921.

- (2) The concept of accounting from the private accountant's point of view.

These concepts are treated below.

Functions of Public Accountant.—The types of services rendered by public accountants, based upon their philosophy of accounting, may be divided into the following classes of services :

- (1) Auditing service.
 - (a) Cash audits.
 - (b) Balance sheet audits.
 - (c) Detailed audits.
- (2) Investigation service for :
 - (a) Purchase and sale of businesses.
 - (b) Reorganization and consolidations.
 - (c) Issuance of securities, new and old.
 - (d) Credit purposes.
 - (e) Income tax service.
- (3) System work, costs, and financial, etc.
- (4) Consulting service, generally confined to some branch of the above services.

The development of this phase of accounting service may be obtained from any of the standard works on the various subjects. This treatise will confine itself to some phases of the function of private accounting.

Before proceeding farther, it might be well to say a few words in explanation of the division of "accounting" into two phases : public and private. Because of the nature of the work and the chance to render specific services, private and public accounting has each developed along lines which best met its own needs. This division would appear to be fairly definitely fixed.¹ The public accountant "is not a prophet" and he has many limitations that need not hamper the private accountant. The public accountant prefers to deal with "accomplished facts" and leave the "interpretation" of these "facts" to some one else. The private accountant, in his quest for information and its "proper interpretation," need not stop short of his goal because of limitations placed upon his work. This, briefly, is the very vital reason for distinguishing private and public accounting.

The Function of Private Accounting.—There should be no cause for surprise, in the light of the foregoing, to find that there are quite

¹ See *Journal of Accountancy*, Vol. 39, No. 4 and No. 5, *et al.*

varied notions as to the nature and scope of "private accounting." Some of these appear below:

Mr. Bliss,¹ in listing the services of the industrial accountant attached to an organization (private accountant), gives the following:

- (1) The development of a proper system and classification of accounts, making such changes and improvements as appear advisable from time to time.
- (2) The operation of the accounting procedure; that is, direction of the accounting forces and work in such manner that appropriate reports and statistics are produced.
- (3) Conveying to the management and operating forces, statistics and information developed from accounts, in such shape that they may be most conveniently and effectively used.

A close examination of this concept of the function of one phase of private accounting reveals that it deals with the "professional accountants'" aspect of industrial accounting. It limits itself to the recording of past transactions and to making reports therefrom. Briefly, it refers to the following: (1) the recording of past transactions in a way that balance sheets, post-mortem cost reports, and "statistical data" based thereon, may be secured; (2) the transmission of this information to management; and (3) the general function of bookkeeping.

Mr. McKinsey,² after reviewing the progress of "private accounting" in large organizations, says that he thinks that "accounting" should cover the functions of the controller. "It is impossible," he says, "to state definitely what the duties of a controller should be."³ It is my opinion that typically he should have jurisdiction over accounting, budgeting, statistics, methods and standards, and organization problems. In some corporations the controller has a separate division in his office responsible for the administration of each of the foregoing groups of activities." This concept of the function of accounting places private accounting in a different category from public accounting. From a knowledge of something of the history of the development of public accounting it may be said that if the public accountants ever undertake to perform services in these fields the development certainly will not be true to type. Some few public accountants are, however, spending much of their time and energy in two or more of the above-named fields which have been shown as functions of the controller. Some

¹ J. H. Bliss, *Management Through Accounts*, 1924, p. 10.

² J. O. McKinsey, *Management Engineer*.

³ *Journal of Accountancy*, Vol. 39, No. 4.

progress has been made in each field, but it is beyond the scope of this chapter to consider its nature and extent.

In view of the nature and function of management presented in Chapter I, and in view of the statements of the nature and concepts of accounting revealed in this chapter, it seems necessary to formulate a concept of accounting which will bring the philosophy of accounting into conformity with the philosophy back of the science of management, and the philosophy of "modern management."

Modern Management.—The application of the scientific method to management problems has evolved what may be called "the science of management." "Modern management" makes use of the sciences, the arts, and philosophy. It is not the purpose here to state just what "modern management" is, if it could be stated. It will probably prove true that "modern management" will continue to adjust itself to new conditions and situations. There are, it would appear, many basic facts which will not change. Under any form of "government" it is difficult to see how large-scale production could survive without the "control" of "authority" and "responsibility." Some of the methods of "control" will undoubtedly change, but it is incredible to think that there will "ever" be a time when records will not be necessary for control. If accounting is to serve its highest purpose, it should be of definite assistance to "management" in the "control" of the business enterprise. It is in this larger sense that the word "accounting" is to be employed in this treatise.

Accounting for Management Control.—In the analysis of the different concepts of accounting it may be observed that a considerable amount of the development in thought along accounting lines can be used for the purpose of control. The extension of Gantt's conception of costs to the other phases of "control" goes far in the proper direction. To bring the philosophy of accounting into agreement with the philosophy of management control it is necessary to state the accounts in terms of standards, accomplishments, and causes for variation. All of these should be in terms of a definite organization. The causes for variation should be properly analyzed and interpreted. Authority and responsibility should be placed and efficiency determined. To carry out this concept of accounting in practice, ways and means must be provided to make the various phases of it properly function.

The Purposes of the Present Work.—The specific purposes of the present work are as follows:

1. To set forth a concept of accounting which may serve management as the basis for "control."
2. To discuss ways and means of setting up certain standards in business by which performance may be directed and appraised, and control of a business may be secured.
3. To discuss ways and means of keeping account of certain business accomplishments in terms of standards.
4. To discuss ways and means for accomplishing the following:
 - (a) To determine causes for variation between standards and actual accomplishment.
 - (b) To analyze the causes of variation and interpret them so as to place effectively responsibility and authority for performance.
 - (c) To show how efficiency may be effectively determined for management use.
5. To discuss certain organization methods and procedure for the business enterprise, and to show how authority and responsibility may be effectively placed for purposes of control.

CHAPTER III

ORGANIZATION FOR MANAGEMENT CONTROL

Business Organization.—The question of proper organization for most effective administrative and management control is a question which gains momentum in a given enterprise as that enterprise increases in size. The growth in the size of business enterprises in the last twenty-five years has brought with it many perplexing problems of organization. Business organization is of two chief types, as follows:

- (a) Legal. Corporations, partnerships, proprietorships, etc.
- (b) Internal. Organization within the business.

Legal Organization.—The legal phase of the organization problem still continues to be an important problem. Some of our large corporations operate in a large number of states and foreign countries. On account of legal restrictions and regulations, it is often necessary for a sizable concern to have many subsidiary corporations to carry on the actual operations of the business. For example, the Bethlehem Steel Corporation at December 31, 1925, had 54 subsidiary corporations, located as follows: Pennsylvania, 24; Delaware, 9; Maryland, 5; Michigan, 4; New Jersey, 3; New York, 3; Massachusetts, 2; Wisconsin, California, West Virginia, and Mexico, 1 each. More striking examples could be found, but the problem is of the same character.

While the question of legal organization is a very important one in the conduct of a business enterprise, it is not a problem which deals so directly with internal control as does the problem of internal organization. Legal control and internal control are, in many respects, inseparable. Internal control is dependent upon legal control for authority to carry out the purposes of a business.

Internal Organization.—The problem of internal organization has to do with the division of the work of a business so that human beings can carry out effectively the work of the enterprise. It has long been recognized that there is much economy in the division of labor. The chief difficulty in the application of this general principle

has been to find out how far the division of labor could be carried with profit. It is doubtful if any sizable business makes as good use of the division of labor as it might profitably make. Some phases of the work are well taken care of, but others which might yield a profitable return are neglected for want of constructive thought and planning.

In recent years much has been said about waste in industry. The management of industrial and of commercial enterprises has been severely indicted for waste due to causes over which they have control. The "Hoover Committee on Waste Elimination" made, what appeared to many managers, a startling report on responsibility for waste. A summary of this report appears in Table 1. In each industry, concerns were rated high by the assayer, but the majority of them

TABLE 1
HOOVER COMMITTEE REPORT ON WASTE ELIMINATION

Industry	No. Concerns assayed	Responsibility assayed against		
		Management	Labor	Outside
Men's clothing mfg...	9	75%	16%	9%
Building industry...	73	65	21	14
Printing.	6	63	28	9
Boot & shoe mfg....	8	73	11	16
Metal trades.....	17	81	9	10
Textile mfg.	13	50	10	40

did not secure a rating of more than one-half of the best-managed concerns. It seems quite probable that a large percentage of the waste attributed to management may be accounted for by management's neglect to extend intelligently the division of labor to its own job as fast as the division and specialization of labor has been carried on in manufacture, etc. The chief executive too often takes the position that he should select certain executives and put it up to them to get results. Truly, this seems an easy way out of the difficulty, and incidentally one not requiring much mental ability, but the consequences are not always what the executive expects. There are many causes for waste over which no one but the chief executive has any adequate control. If the chief executive does not accept his own responsibility he should not expect others to accept theirs, and the chances are that best results will not be secured. A fuller discussion of the duties and

responsibilities of the various executives appear in several chapters dealing with this subject.

Types of Internal Organization.—During the last thirty years writers have come to recognize quite different types of internal organization. Some of these types will be briefly discussed because of their bearing upon the subject of organization for control.

Line Organization.—This is the oldest known form of business organization. It is the type of business organization most predominant today in small concerns. The manager of most comparatively small enterprises today performs a multitude of duties: buying, selling, financing, hiring, training, advertising, and all the other functions of the business. If the business is successful, the general manager will not be able to perform all the major functions of the business, so that he may find it necessary to hire a production manager and a sales manager to perform these functions in accordance with his directions. The sales manager and the production manager may perform all the duties entrusted to them or they may hire others to carry out instructions. This may be carried on as far as desired, so that we have a "line" of authority and responsibility running from the "top" to the "bottom" of the business. The chief executive in the line form of organization usually exerts a direct influence throughout the organization, if it is possible for him to do so. Much of his time and attention is directed toward the solution of problems in which he may have a special, or a hobby interest. For example, if the chief executive feels himself sufficiently posted on factory methods and procedure, he may spend a good portion of his time in the plant, and the plant manager may find it quite politic to welcome all suggestions, good or bad, and be often solicitous of opinion as to the best way to handle a given situation. The strength of this type of organization is its greatest weakness. It is strong when a strong chief executive is properly supported by equally able sub-executives, and the technical knowledge required to run the business is not beyond their powers and their training. It is weak when the technical knowledge and training which is required in most lines of business is greater than line men may reasonably be expected to possess. At this stage of development in an organization a change in the form of organization is required for most effective results to be secured. This change is often made by the addition of staff men to the organization. The organization then becomes line and staff.

Line and Staff.—The chief difference between the line, and the line-and-staff form of organization is that the latter form of organi-

zation makes use of technicians. The technicians find the facts upon which line men are to base certain decisions. The type of work done by the technicians depends upon the particular conditions of each concern. In the dairy business, for example, the chief executive would soon realize the absolute need for a chemist. Before the dairy business proceeded on an extensive scale, the necessity would be felt for the services and the advice of doctors (medical and veterinary), lawyers, bacteriologists, dietitians, engineers, accountants, and a great number of other technicians. There is a distinction between a staff man and a man who performs a staff function. The chemist and the bacteriologist may find enough work to do so that it would be more advantageous to employ them at regular salaries than to employ them by any other method. The technician who works for a salary is called a staff man; he performs a staff function. The technician who secures fees for his services performs a staff function; he is not, however, a staff man.

The staff function, in the true line-and-staff form of organization, is an advisory function. The staff secures certain facts upon which the line men act, if they choose to do so. When the staff man has rendered his report, if no further explanation is requested by the line men, the staff man has fulfilled his responsibility. If the management likes to be "sold" on facts before any action is taken on them, the staff man will find it necessary to perform other than true staff functions in order to justify his services in the eyes of the management. The management wants ideas and facts that can be used advantageously, and they not infrequently have to be "sold" ideas and facts before they put them into use. Possibly the most serious weakness of the line-and-staff form of organization is that line men frequently "pigeon-hole" as impracticable the ideas and facts developed by staff men. For various reasons the line men have not been "sold"; consequently nothing beneficial to the concern comes of the expended effort. The staff, however, seems to get enough of its work recognized to make the line-and-staff form of organization a very important form of organization at the present time.

Functional Form of Organization.—Frederick W. Taylor¹ has been recognized as the originator of this type of organization. The idea back of this form of organization is that of dividing the work of management so that the advantages of the division of labor may be effectively secured. Taylor, for example, in the organization of a machine shop, advocated a form of organization that may be repre-

¹ *Shop Management.*

sented by Figure 2. The management job was broken down so that it was possible to find "foremen" who could perform one major function but who might never be skilled in eight major functions. The development in the specialization of management functions was in agreement with the division of labor in other fields, and has been used effectively in all forms of internal organization.

There has been much criticism of "functional" management because the workers have to come in contact with so many bosses and because

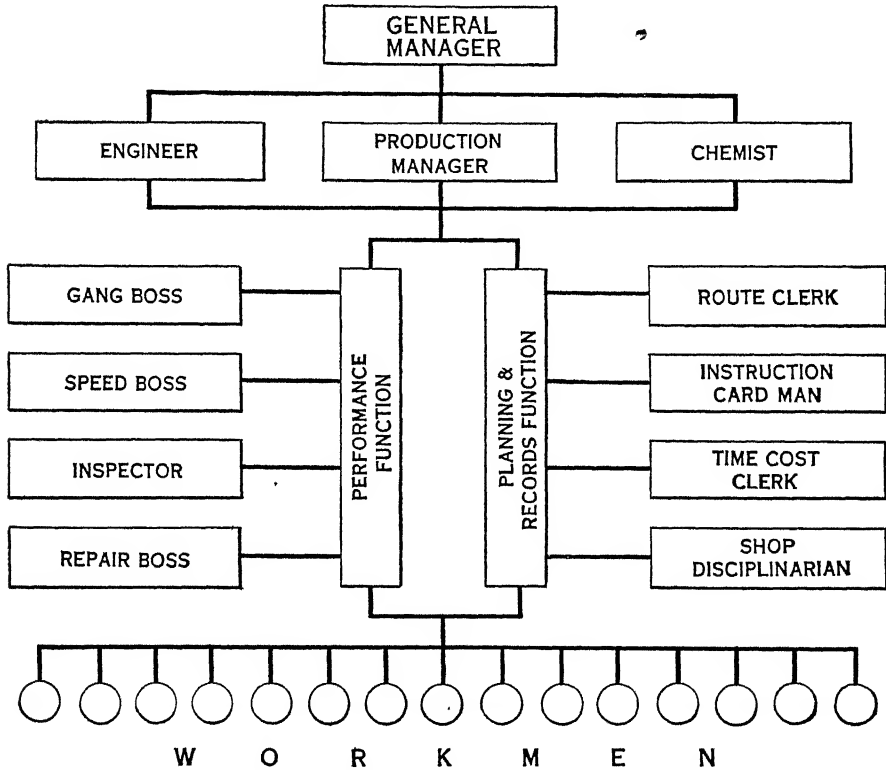


Figure 2. Functional Organization.

the "overhead" expense is higher than under the line form of organization. The latter criticism has been made by those who consider "overhead" as an "unproductive" expense, and an expense that is to be tolerated only to a very minor extent. This, however, is not a valid criticism because specialization of jobs, within certain limits, makes possible greater economy in production than can be secured by methods which do not adequately consider this principle in organization. The criticism that the men have to come into contact with too many bosses

is largely a matter of preference and without much regard to the quality of the service. One might say that he thought it much better to have a general-practice physician than eight or more specialists to attend his needs. If, however, he is particular as to the quality of service, he will call on the dentist to repair or pull his teeth; the osteopath to treat his colds; the various specialists in surgery to operate on him; and so on. It would appear from what is known of the multiplicity of things that takes place in a machine shop, for example, that it is just as likely that the general-practice physician could give quality service in the treatment of human ailments as the general foremen could give quality service in the management of a machine shop. In either case, the services might be satisfactory to the recipient. It would be hard for one who has been accustomed to receiving specialized services in management to adjust himself to general services of management. If the savings that can be effected by this division of other than management labor are to be increased and maintained, there must be a corresponding division in management labor. It is not contended that the ratio of increase in each group should remain the same; it will probably have to be increased in the management field.

Departmental Organization.—The departmental type of organization is a hybrid of the line and the functional form of organization. The manager of a growing concern is soon faced with the necessity of having others assist him in managing the concern. One way to do this is to assign to others independent portions of the work and expect "satisfactory" performance from them. The department store is a good illustration of departmental organization. Some large department stores have hundreds of "departments." If the store were organized along strictly departmental lines, it would appear as if a large number of separate concerns were brought together under the same roof. Such an arrangement would be uneconomical and for that reason organization is along functional lines. Ordinarily the functions are centralized in four main divisions, as follows: (1) merchandising; (2) publicity; (3) store management; (4) controlling. The department store gets its name not from the internal management organization but from the method of classifying merchandise. Most businesses of the so-called "departmental type" of organization are not true to type. Usually they have certain classes of operating functions performed in "departments," but the internal management organization is far from the departmental type. Few businesses are organized true to any particular type of internal organization.

Some illustrations of the way in which businesses are organized will serve as a basis for further development.

The Walworth Manufacturing Company Organization.—The organization chart of the Walworth Manufacturing Company is shown in Figure 3. The line executives are: (1) president; (2) treasurer; (3) secretary; (4) vice president in charge of production; (5) vice president in charge of administration; (6) vice president in charge of sales. The heads of the staff sections are: (1) assistant to the president; (2) head of the planning and statistical

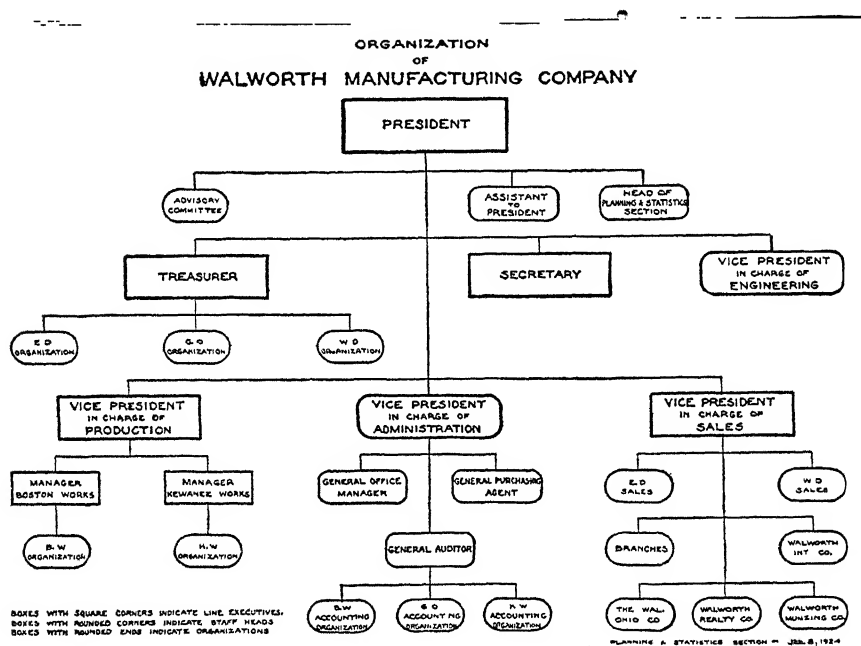


Figure 3. Organization Chart of the Walworth Manufacturing Company. (See Figure in Bulletin of the Taylor Society, page 113.)

sections; (3) vice president in charge of engineering; (4) vice president in charge of administration; (5) general office manager; (6) general purchasing agent; (7) general auditor. These line-and-staff men are in charge of certain "departmental" organizations through which the business of the corporation is carried on. The "standard practice instructions" sets forth the duties of each line-and-staff man, together with the duties of each member of the organization. The advisory committee serves as a coordinating body for the entire organization. Mr. Barber¹ says of the organization:

¹ Bulletin of the Taylor Society, Vol. IX, No. 3, p. 112.

R.H. Macy & Co
150 WALL STREET, NYC NEW YORK



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The initial step leading up to the organization of the company in this manner had a very definite aim in view. It was to enable the company to take the next step, namely, to devise an accounting system which should hold each executive financially responsible for all the activities within his jurisdiction. The accounting arrangements, as they are now set up, make it possible for each production and sales unit executive to receive, promptly after the close of each month and covering his unit only, a profit and loss statement, a balance sheet, and a detailed expense analysis. Each subordinate executive receives a detailed expense analysis embodying the month's charges against him for all items of expense which the existence of his section incurs. This close coordination of accounting with the simple lines of organization we consider essential for the desired ultimate statistical control.

The planning, the performance, and the recording of results are separated in this organization. Staff members compute what results should be obtained in the future, and with the president's approval of the plan, the operating departments strive toward the goal. The accounting department shows the results obtained in performance.

The R. H. Macy & Company Organization.—The organization chart of R. H. Macy & Co., department store, is shown in Figure 4. All of the functions of the business are grouped under four main divisions, as follows: (1) merchandise; (2) general management; (3) finance; (4) publicity. There is an advisory council, a board of operations, and a planning department.

A feature of this organization chart which deserves some attention is that of the planning department, which is shown as a staff function and which is subject to the control of the board of operations, a committee. A more recent organization chart of the controller's division shows that he has control over all functions necessary for the control of the enterprise, while the planning department does specialized research for the organization as a whole.

The Joseph & Feiss Company Organization.—The organization chart of Joseph & Feiss Co., manufacturers of clothing, is shown in Figure 5. There are four main divisions in this organization, as follows: (1) finance; (2) purchases; (3) manufacturing; (4) sales. The main purpose in setting up the organization chart as it is here set up, is to have an organization classification which will fit in with the cost-accounting system and determine the overhead expenses. This chart does not show expenditures for direct labor and materials. The chart shows that the accounts are in terms of the organization. Expenditures are analyzed a step farther than the chart shows so as to show salaries, wages, supplies, etc. Mr. Keppele Hall, in a letter, says:

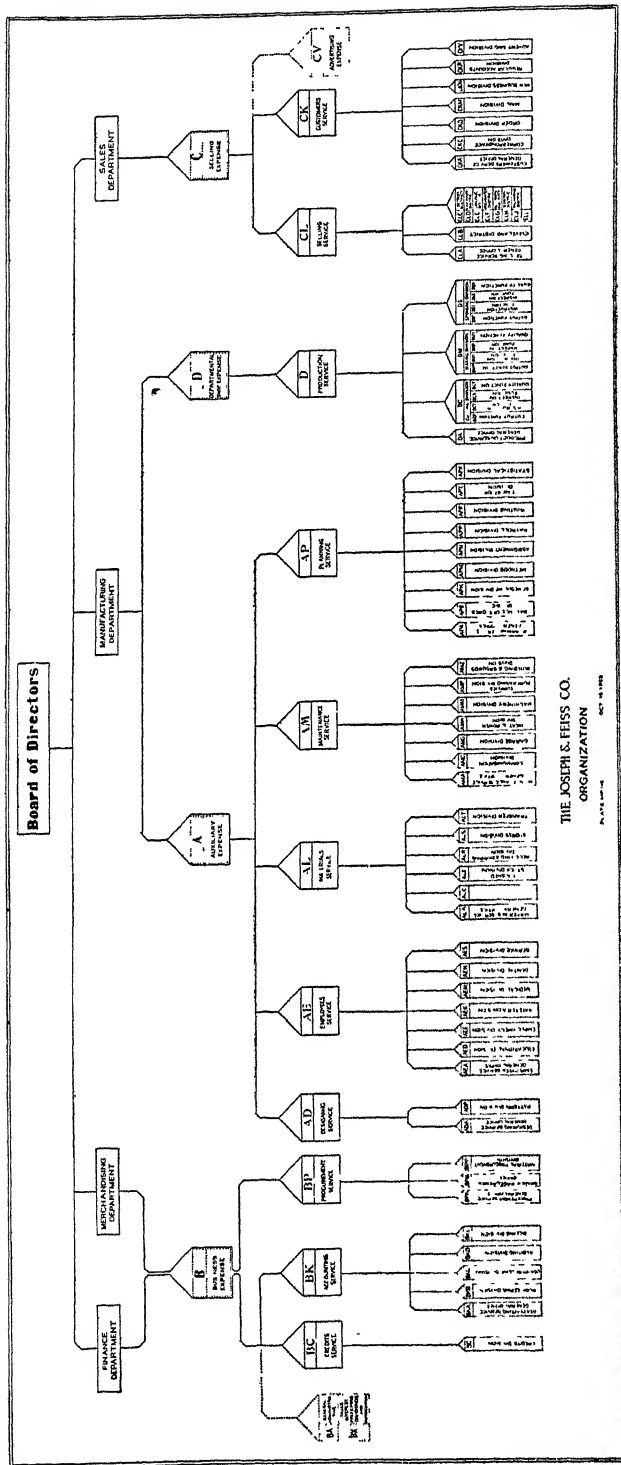


Figure 5. Organization Chart of the Joseph & Feiss Co.

You will see that this permits of the summation of all expenses in every division, in every service, in every group, in every department; and these in turn are distributed over the product in arriving at its cost.

Much could be written about this chart, but it speaks well for itself and it can be understood readily.

General Motors Organization.—In a large and widely distributed organization some serious questions arise as to methods of placing

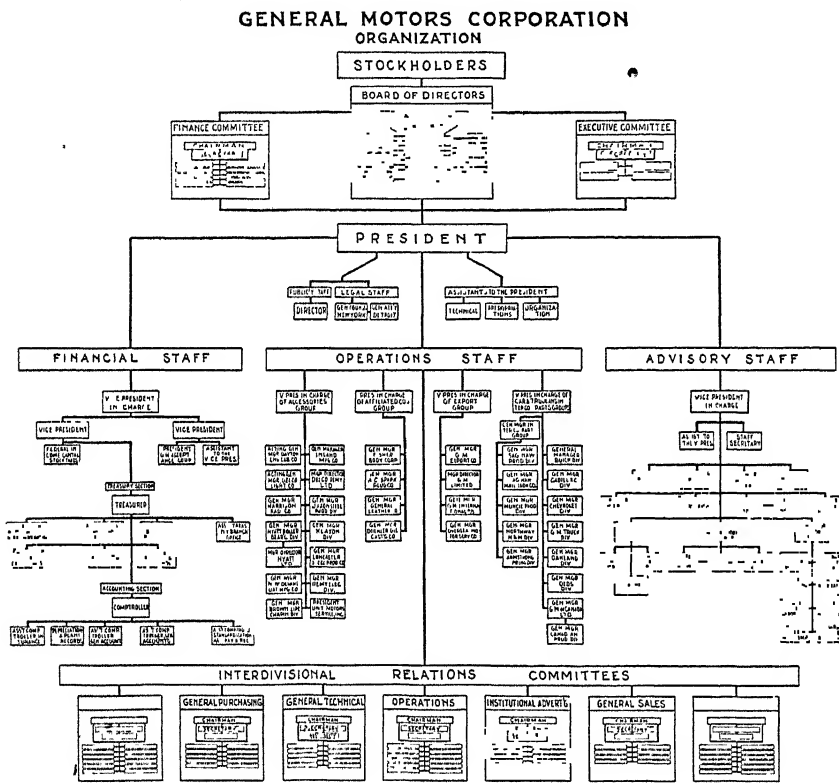


Figure 6. Organization Chart of the General Motors Corporation.

and controlling authority and responsibility. The organization chart of the General Motors Corporation is shown in Figure 6. The board of directors is served by two committees: (1) the finance committee and (2) the executive committee. The president is chairman of the executive committee, as well as active manager of the corporation's affairs. The chairman of the finance committee holds the title of vice president. He formulates the financial policy of the corporation and is in charge of the financial staff. The president has line control over

the vice president in charge of finance, but each is chairman of an important committee which is appointed by the board of directors. The president has a staff to assist in certain functions not performed by other members of the organization.

In the performance of the work of the corporation the president is assisted by several major vice presidents of General Motors who are in charge of the following: (1) general finance; (2) acceptances; (3) accessories group; (4) affiliated group; (5) export group; (6) car and truck group; (7) advisory. In order to make the experience of various corporations available to the group, some committees have been organized for the purpose of recording experience and putting it in a usable form. The chart shows five such committees. Most large corporations find it very advantageous to have a proper organization to record experience and make the experience, good or bad, available. If this were not properly done, much time, effort, and money would be wasted in making the mistakes that others have made. If good and bad experiences of others are made available to executives, when and where they require them, there is little excuse for the corporation having to bear more than once the expense of finding out "how" to do or "how not" to do a specific thing. By the proper recording of experience it is easy to understand how an adequately trained research worker could discover principles that would make the science of management an exceedingly valuable guide to the art of management.

In the management of a large affiliated group of corporations like the General Motors Corporation, the president must rely upon managers who can control certain broad functions of the corporate activities and yet have the actual responsibility for carrying out operations left to the executives who are near the scene of action. The vice president in charge of the accessory group is an example of this principle of organization. He is a specialist of a certain type of management specialists, who in turn are specialists of other management specialists. The General Motors form of organization brings out the use to which committees can be effectively used. Much more could be said about this form of organization if space permitted.

The Corona Typewriter Company.—There are a number of concerns in this country that make and sell to consumers specialized products, such as: adding and computing machines, typewriters, sewing machines, washing machines, vacuum cleaners, etc. The organization chart of the Corona Typewriter Company (Figure 7) may be used to illustrate the manufacturing function of a "one product" company.

The works manager is the executive head of the manufacturing phase of the company's work. The purchasing department and the employment department are two major functions which are under the direction of the general manager or the chief executive, and upon which the works manager relies for certain services. In the operation of the plant the works manager is served by two committees: the factory advisory committee and the supervision and department head conferences. Through these committees, the works manager is enabled to have presented information of interest to the several members of each committee, and to get their reactions and criticisms.

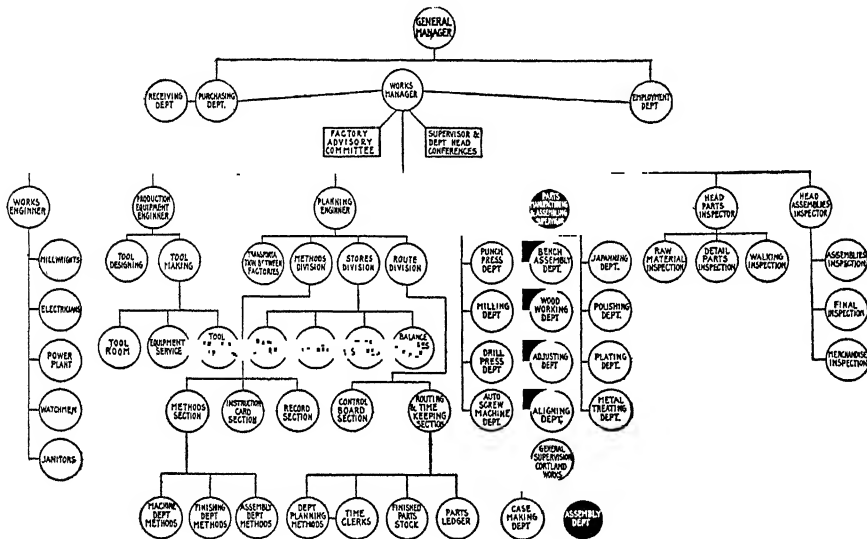


Figure 7. Organization Chart of the Corona Typewriter Company. (Found in: Bulletin of the Taylor Society, Vol. 8, No. 1, p. 13, Feb. '23.)

The work of the factory has been divided along broad functional lines into the following: (1) works engineer, in charge of the buildings and power; (2) production equipment engineer, in charge of the equipment, the tools, and their services; (3) planning engineer, in charge of methods, stores, routing, internal transportation; (4) parts manufacture and assembly supervisor, in charge of manufacture and assembly of machines; (5) head parts inspector, in charge of inspecting raw materials, in-process parts and finished parts; (6) head assemblies inspector, in charge of the inspection of assembled parts, final inspector after assembly is completed, and final inspector of machines before leaving storerooms.

The general features of the work to be done in specialized plants is not essentially different from the work done in other types of manufacturing businesses. The only difference seems to be in the magnitude, kind, and quality of the work to be done. In a plant which manufactures a specialized product the division of labor and the specialization of machinery can be more effectively used than where several products have to be made. For this reason the manufacturer of a varied line of grades and classes of products finds it necessary to lay out and route work so that many of the economies of mass production are obtained. This has often resulted in having to rearrange the whole layout of a group of factories. It has also resulted in having to: (1) standardize products, (2) simplify products, and (3) abandon products. After the necessary changes have taken place the functions of management are the same as before, but the division of the management task may not be the same as it was formerly.

The Dennison Organization.¹—The organization chart of the Dennison Manufacturing Company is shown in Figure 8a. The place of the merchandise managers in the organization is noteworthy. These managers not only select the goods to be sold but determine production. The general sales managers have control over salesmen, but the pricing of commodities and the determination of quantities to be sold are functions of the merchandise managers. Thus, the merchandise managers may give their whole attention to merchandising, without having to deal with problems connected with sales personnel and other problems not necessary for merchandise control.

The company operates some retail stores for the purpose of keeping in direct contact with the consumer. Salesmen and sales managers are also encouraged to offer suggestions for new products and new uses for old products. The merchandise managers have in mind a number of new products which are not released until they are needed to keep the plant operating at capacity.

Sales Organization.—The profitable disposition of goods is often a greater problem than is the problem of procurement. Many manufacturers have found that the production of their plants was greater than could be sold at profitable prices through the sales channels employed. This necessitated new marketing methods. The question of sales organization methods and control, under the new conditions, are of first importance. Many different methods have been applied

¹For a fuller discussion of this organization, see Bulletin of the Taylor Society, Vol. VII, p. 230, and other numbers.

to the sales organization problem. Two prominent corporations have, after several years of study, decided that the proper type of sales organization is the one that is capable of being centrally controlled. The Dennison Manufacturing Company changed from a decentralized to a centralized form of control. The Burroughs Adding Machine Company changed from indirect control to direct control. Figure 8

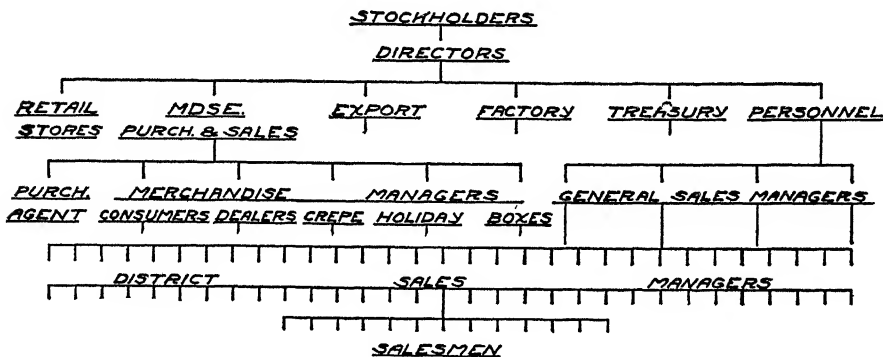


Figure 8a. Organization Chart of the Dennison Manufacturing Company. (Reprinted from B. N. of the Taylor Society, Vol. VII, p. 230.)

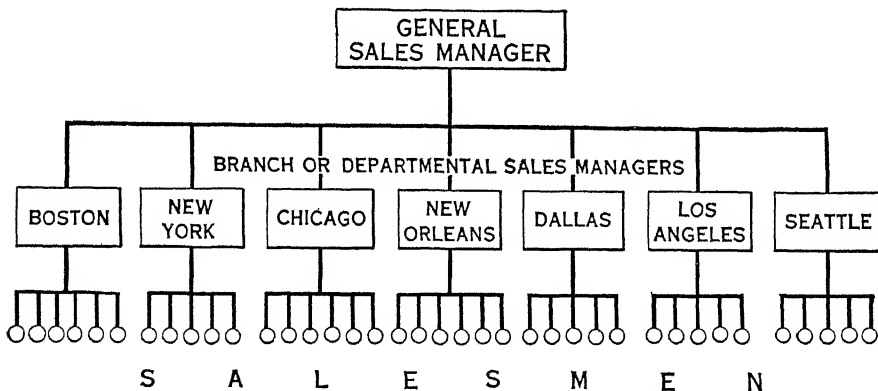


Figure 8. Centralized Control Organization Chart.

shows the line of control in an organization which is centrally controlled. Branch offices are maintained in various cities and certain territory is covered by representatives of each branch. This kind of organization is well adapted to many lines of business. Figure 9 shows a form of organization where the line of control is direct. The general sales manager, with the assistance of a staff, is in direct control of every salesman in the organization. Each salesman has a definite territory. This type of organization may be effectively used in the marketing of some specialized products. Where the volume of work

is great, however, the general sales manager may find it difficult to direct properly the work of so many salesmen scattered over such a wide territory. Where direct control is not practical, the centralized method of control has been found to be effective, if properly used.

Interdependence of Functions.—One of the most important principles of business organization is to organize the business so that the interdependence of functions will be the most effective. This principle of organization is based upon the principle of the division of labor. The important question is “how” to divide labor as to make results most effective. In many cases this question can be scientifically determined. From the formulæ which may be developed to determine the profitableness of the specialization of certain labor, it would be possible to determine the approximate effectiveness of any given division of labor.

The functions of a business are interdependent and should be held

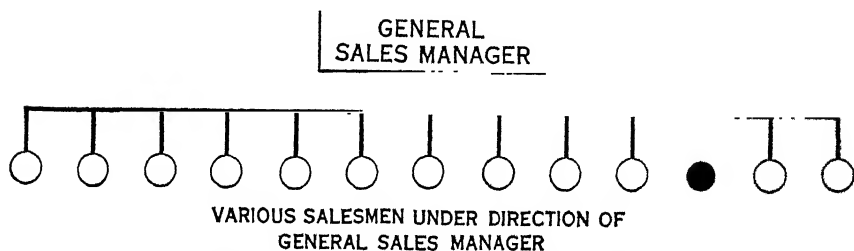


Figure 9. Direct Control Organization Chart.

in proper perspective each toward the other. Executives and employees are often prone to overemphasize the importance of their own work. Authors, too, do not always make an effort to keep a proper perspective, the consequence of which is that many readers fall into the same error. One does not have to talk very long to some executives in business before he finds that, in the mind of those executives, the “accounting” department is “unproductive” and, for the most part, unnecessary. In such cases this is undoubtedly true, not because the function of accounting is not important, but because the useful services of the accounting function were not “sold” and “delivered” to those executives. Such misunderstanding of the interdependence of functions is a very serious question in most business organizations of any considerable size. As a consequence, incredible losses frequently occur, and the possible achievement falls short in attainment for the lack of services which some other function might furnish, if requested to do so. The truth and the importance of these remarks, if not apparent

to the reader, will be made more apparent in later chapters. (See, for example, Chapter XI.)

In the conduct of a business enterprise a constant effort should be made to lead the executives and the employees to see the necessity for the conduct of the business as a whole. The business cannot be con-

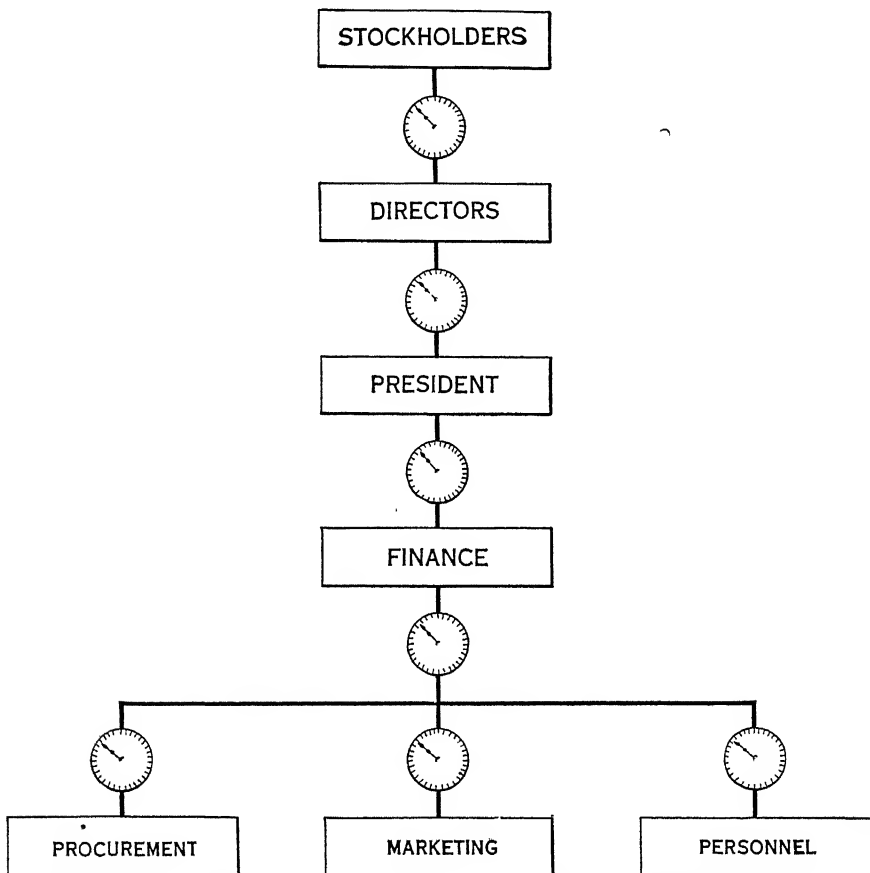


Figure 10. The Scales Show the Location of the Accounting Function in the Organization.

ducted as a whole unless the perspective of each executive and each employee is such that services of an interdependent whole can be effectively used to carry on the business. The purpose of accounting, among other things, is to serve as an aid to management in the conduct of a business as a whole, and unless accounting does so serve management it is not accomplishing its highest purpose.

Accounting Function in the Organization.—The content of the present chapter up to this point has been designed to show the general

features of internal business organization. Attention will now be directed to the special function of accounting. If the accounting function is to serve a business commensurate with its potentiality, the organization should be so designed as to make this possible. In Figure 10 the accounting function is shown figuratively as a series of scales. The stockholders "weigh" the directors, who in turn "weigh" the president. The president weighs finance, which in turn weighs procurement, marketing, and personnel. The business is weighed in the "accounting balances," and so is each constituent part. A falling off in the "weight" of any function may be reflected in each set of scales above that function. If each function be designed to "weigh" a certain amount, then the total "weight" may be determined. When the actual "weight" of each function is measured by the scales, it will be known how close the actual "weight" is to the predetermined "weight." Any variation between predetermined and actual weight may be analyzed and the causes for variation in weight determined. The above figurative visualization of the accounting function, in many respects true, requires fuller explanation.

The work of the accounting function is performed by certain means and in certain ways. Work is customarily measured in units of one kind or another. The work of a business is generally measured in terms of a medium of exchange. One of the functions of accounting is to measure the work of a business and make the results known in terms of a standard, which, in many cases, must be in terms of financial standards. In order that a business may succeed in a financial way, certain financial standards must be maintained. A function of accounting is to aid management in maintaining financial standards. As financial standards and their control are important to the success of a concern, an effort should be made to provide proper means by which such control may be secured. This may be done by providing a proper organization to carry on the accounting function. The lines of organization must be clearly defined and capable of being weighed not only as a whole but as separate entities. Unless the organization is so weighed it is liable to get out of balance. One of the important aims of "control" is to have a well-balanced organization and this cannot be done unless "accounting" can weigh each major function separately.

Management Control.—In the previous chapters the principles of organization for management control were outlined. In order to show the relation of accounting to management, and to show the importance of proper organization for accounting control, it may be well to con-

sider some of the relations between the chief executive and the chief accounting officer.

The chief executive, in a sizable concern, will not be able to execute the details of much work, so that the chief executive becomes an official whose chief duty is to pass upon plans against which accomplishment is to be directed. To accomplish this aim, the three principles which follow should be observed:

- (a) With responsibility for results should go the power to get results. (Gantt.)
- (b) Delegated authority should be definite as to results desired and an assay of possible accomplishments.
- (c) Those who delegate authority should have definite information as to the progress of the work; definite information as to the accomplishments; and the causes for the success or the failure to accomplish predetermined results.

To carry out these principles the chief executive requires records and reports, which function is customarily performed by one whom, for want of a better name, we may call the controller. The controller is the chief accounting officer. To accomplish the work of the accounting function, the controller must be assisted by a corps of employees. The relations between the chief executive and the controller are simple in principle. The controller provides ways and means for the chief executives to set up plans so that accomplishments may be recorded in terms of the plans, and causes for variation measured. The interpretation of causes for variation between predetermined and accomplished results is one of the most important functions of the controller, and to accomplish this purpose the proper information must be secured under the direction of the controller.

The controller, in order to coordinate properly certain functions of an enterprise, should be in charge of general accounting, costs, statistics, auditing, credits and collections,¹ office management, finance, budgeting, research, and standards and records.

The reasons for the accounting function being located in the controller's department are as follows:

- (a) It standardizes and coordinates the information.
- (b) It eliminates duplicated information, such as books, records, and reports.
- (c) It facilitates proper interpretation.

¹ Reasons for placing credit and collections under the controller are given in Chapter VII, p. 101, Chapter VIII, p. 136.

These reasons are brought out by the experience of many enterprises, a few of which are: (1) the Western Electric Company; (2) R. H. Macy & Co.; (3) the Emporium; (4) the United States Rubber Company. These concerns have found that best results are obtainable only when the controller has charge of all the means by which internal information is to be secured for the purposes of executive control of the enterprise. There are, however, different points of view as to uses to which "accounting" is to be put for purposes of control. These points of view have been indicated previously, but are of enough importance to be briefly reviewed.

Principles of Accounting Control.—Three concepts of the function of accounting used for control are:

1. The function of accounting should be to reflect transactions already completed.

Under this concept of the function of accounting the form of accounting organization should be such as would make possible the orthodox balance sheet and profit and loss statement. Here the accounts may or may not reflect responsibility. They may or may not undertake to gauge the results of the organization other than as a unit. The lines along which an accounting department would be organized to accomplish the purposes which this concept connotes should be different from the lines along which an accounting department would be organized to accomplish a different end.

2. The function of accounting should be to reflect the results of transactions already complete, and to compare these results with the results obtained in prior periods, which are used as standards.

In addition to properly drawn balance sheets and profit and loss statements this concept may make use of past accomplishments with which to judge the past accomplishments of a different period. Many estimates of future operations are based largely, if not entirely, upon past results and the estimate called a "budget." Such an estimate is of some use but not of as much use as is a budget.

3. The function of accounting should be to reflect the accountability of those vested with authority, in terms of standards, accomplishments, and causes for variation.

This concept has as its object to reflect the accountability of persons entrusted with authority. It does so in terms of organization. Results

are recorded in terms of effects, causes, and accountability. To accomplish these aims, use is made of budgets which follow the line of organization. These budgets are "complete" as to the details of "quantities," or the "services," the prices, and the amounts. The accounts and the analyses are kept in terms of the budget. When comparison is made between the accounts, which represent "effects," and the budget, the "causes" for variation are determined. So kept, accounts become desirable tools for control.

Principles of Organization for Accounting Control.—The concept of accounting which one holds places limitations upon his work. Fortunately, accounting can be of service to management and administration, no matter which concept one has as to the nature and function of accounting. The smaller the task one assigns to his "accounting" the less effective can accounting be used for purposes of control. If accounting is to serve best as a means of aiding management in the control of a business enterprise, it must have a threefold perspective: an outlook into the future; a proper visualization of the present; an adequate knowledge of the past. This threefold perspective is here accepted as the basis for accounting.

The principles of organization for accounting control may now be stated in a summary form, as follows:

1. The organization must be so planned that authority to secure a given end may be effectively placed, and the responsibility for securing results may be in terms of the authority given. This end may be accomplished by showing accountability, results, and causes for variation between accountability and results in terms of a definite organization.
2. The chief of the accounting function should direct the preparation and interpretation of internal business information to be used for forecasting the future, in visualizing the present and in recording the past.

CHAPTER IV

THE RELATION OF ACCOUNTING TO MANAGEMENT CONTROL

Management Control.—In the conduct of a business enterprise the question of how best to secure management control is ever present. Management control is secured on the basis of information which may come from three main sources, as follows: (1) information gathered in daily contact with the details of a business or from any other personal source; (2) information which comes from records of past accomplishments; (3) information which may come from planning, doing, and reviewing the performance in comparison with the plans. The basis of management control is information properly gathered and correctly interpreted.

In a previous chapter, management control was divided broadly into internal control and external control. Internal control, from an organization point of view, is divided into: (1) internal control from the point of view of the policy corps, and (2) internal control from the point of view of the executive. From the viewpoint of the policy corps, it denotes the ways and means by which this corps can ascertain whether or not the policies of the business are properly carried out and what have been the results of those policies. This requires accounting information of the highest type. From the viewpoint of the executives of an enterprise, and particularly the viewpoint of the chief executive, it refers to the ways and the means of making administrative policies effective.

Relationships in Management.—The relationship of the major functions in business organization is one of the factors which must be kept constantly in mind when information is to be gathered and interpreted. The inter-relationships between the various individuals of an organization are sometimes exceedingly complex. Where complex relationships between various members of an organization occur, the question of fixing authority and responsibility is likewise complex. If accounting information is to serve best as an aid in management control, the relationships in management must be simple and direct.

Information of value in business must be secured from individuals who are not always sympathetic with the accounting department. How best to secure the necessary data involves the complex relationships in business management. The necessary accounting information should be secured from reliable sources and with a minimum of resistance. Resistance will be least if it is necessary to use the data from day to day in order to do particular jobs in an acceptable way.

For example, a receiving clerk will take particular care to see that the number of items is correct, which he indicates has been received, if he knows that the "blind" receiving invoice which he uses must check with the purchase order as to "quantity"; else he might be found in error. The manager of a manufacturing department will be careful to see that everything is done in accordance with standards and proper information furnished of achievement, if he knows that the standards will be used to check against performance. For him, it is a course of least resistance.

Objects of This Chapter.—The prime objects of this chapter will be to enumerate and to discuss briefly some of the chief ways and means by which accounting may be used as an aid to the solution of some business administrative and management problems. This kind of analysis must be broad and must leave to subsequent chapters the detailed analyses necessary for a more comprehensive development of the subject.

The Aim of Accounting.—If accounting is to serve the needs of a sizable business enterprise it must have a comprehensive aim. Few enterprises have adequate control of their affairs. They do not place effectively authority and responsibility, and efficiency cannot be determined in a comprehensive way. If accounting is to serve best the needs of a business, it must aim at the solution of these problems. An illustration may be used to help visualize a desirable aim of accounting.

The business enterprise may be conceived of, figuratively speaking, as a large naval gun attached to a battleship; the battleship represents the finance of the business. The organization and the other assets of the business may represent the ammunition for the gun. The administrators may be conceived of as the designers of the gun and the ammunition, and as the ones who are responsible for its effectiveness in use. The management may be conceived of as those to whom the firing of the gun is entrusted; the chief gunner is the chief executive. The navigable water may be conceived to represent the business world; the rocks and seashore business failure; the wind, waves, smoke, etc.,

as the business cycle and external conditions. After the gun and the ammunition are provided, the first problem will be "to test the gun." If the designers of the gun and of the ammunition are familiar with the scientific method and the past and possible performance of guns, the testing of the gun may proceed along somewhat the following lines :

1. With the data available upon the past performance of guns of a similar type, the gun and the ammunition will be designed, manufactured, and placed in a position for action.

2. In the design and manufacture of the gun and the ammunition, care will be exercised to see that they are properly adjusted to each other, and that the foundations of the gun are secure in the battleship.

3. Instruments may be provided to determine the direction and velocity of the wind and the tide, and their action upon the ship and the target. Means for recording the experiment will be provided, and methods for the scientific interpretation of the data will be devised.

4. After everything is in readiness, the experiment may be begun. The designers may proceed somewhat in the following way: estimate the distance to the target, and determine the elevation at which the gun must be fired, after allowing for wind and waves, etc., in order that a shot might hit the target. The chief gunner would then be instructed to hold the gun at a certain elevation and fire "one hundred shots" at the target. An accurate and adequate record would be made, in terms of expectancies and results, of every detail of the experiment. The same kind of experiment may be carried on in order to find the most probable value of each factor entering into the performance of the gun. Briefly, this is the procedure that is used in finding out what a gun will do, and how to use the gun most effectively in action.

The solution to business problems should lie along the same lines as finding out the performance of a naval gun. Before the science of gun firing was demonstrated, there was just as crude an art in firing guns as there is in most businesses today in the art of management and administration. Of course the two problems are not identical in subject matter but the solution lies in the same direction: the application of the scientific method to business methods, as the scientific method was applied to gun firing.

In a battle the battleships have many kinds of tactics, and a smoke screen may obstruct the determination of any but an approximate location of the target. The services of balloons, airplanes, and other devices are made use of to tell whether or not the shots will

probably be effective. In order to carry on an effective battle with warships, three kinds of information must be available immediately for executive and administrative use. There must be: (1) a knowledge of the location of the targets and the factors that may influence the shots in making hits; (2) the results accomplished; (3) the causes for failure. If accounting is to aid properly the administrators and the executives in the conduct of a business enterprise, it must furnish them information of this threefold character: the causes for failure in terms of standards and results.

Records Kept of Standards; Results and Causes for Variation.

—The aim of accounting, as it is used in most businesses, is to record results obtained and to make this information available. As an aid to the control of a business, records in terms of results only, furnish as much information for determining "hits" as records prepared in testing a naval gun, if such records revealed no more information than results. The records of the gun test may be very accurate as to where every shot hit, and these data may be manipulated by all the known accounting and statistical methods; but when it is revealed that the gun has been fired at a variety of elevations, distances, wind directions and velocities, atmospheric conditions and other variables, it must be admitted that the records are of little management use. Of course, methods have been devised by which it is possible to determine the approximate location from which a gun was fired by a knowledge of factors ascertainable from the point where the shell struck. The French did this during the late war. Such methods, however, are indirect and are seldom as accurate as are the results obtained by the direct method.

Accounting, as it is now customarily applied, shows the financial results of transactions in terms of effects. What causes contribute to the effects is a question which ordinary accounting does not consider. The changes in the financial position of a concern, for example, are recorded so as to show the effects that have resulted. Further, if the cost of a given article varies from one period to the next, a study of the ordinary accounting records will not show the "actual" reasons for this variation. With no method of knowing "what should be," there is no way of telling "why" variations take place.

Suppose that the gunners on our warships were allowed to estimate the position of the target and fire at any elevation their best judgment dictated. What success do you suppose that they would have in hitting targets thirty miles away? Of course the accuracy in results

might increase as the target was brought closer, but under these conditions a less skillful group of gunners could get much better results if properly assisted by the science of gun firing and the necessary information to apply this science. Most sizable businesses, it must be acknowledged, are managed and administered in such ways and by such means that "firing" has to take place at exceedingly close range. Not infrequently the range of fire is so close that the business "fires" upon itself. It is true that if all gunners are in the same situation, each will have an equal chance of success. It does not seem reasonable to suppose, however, that if some of the gunners are properly assisted by the scientific method, the nonscientific gunners would stand anything like an equal chance with the former gunners. The analogy of the science of and the art of gun firing, and that of the science of and the art of management might be carried much farther, but it is thought that the comparisons made above have served to show the importance of records in terms of standards, results, and causes for variation.

Accounting as an Aid to Business Control.—The task of finding ways and means to accomplish a given end is often most difficult under the scientific method of approach. If the results are important enough to justify the finding of scientific facts, ways and means of discovering these facts are of much importance. From what we know of waste in business it seems evident that much time, effort, and money could be invested profitably in finding out how to use accounting data most effectively as an aid to the control of business. If the accounting department, in a sizable concern, is to be most effective as an aid to administrative and management control, it should embrace all the ways and all the means that are essential to make the department function properly. The exact nature of the ways and the means may vary in individual cases, but a generous use of information from several "branches" of knowledge are essential for best results. The several "branches" of knowledge which it seems necessary to make a liberal use of to secure accounting control, and which serve as inseparable parts of accounting, are as follows:

1. Standards and records:
 - (a) Budgets.
 - (b) Accounting, in terms of results.
 - (c) Cost accounting.
 - (d) Statistics.
 - (e) Financial accounting.

- (f) Auditing.
- (g) Reports.

2. Ways and means for making the different branches of accounting effective in serving their purposes.

An understanding of accounting, so far as it relates to management, necessitates a study of standards and records, and the ways and means of making them effective.

Standards and Records.—In a broad sense accounting has to do with standards and records, and ways and means for making standards and records most effective for administrative and management uses. There are many different kinds of “standards” that can be used in business. A standard is “that which is established by authority as a rule or measure.” Standards may change from time to time so that standards are relative, but they are indispensable in the conduct of a business enterprise. Standards need not be the very best that could be devised by elaborate research. The standards should be adequate to the needs of the business, and the best way to find this out is to study the standards in the light of pertinent facts ascertainable by research.

There are many kinds of records. The word “records” generally means something quite definite to the bookkeeper, but here, too, it must be observed that records may be prepared for a variety of purposes. In accounting work, records may be prepared to show present, past, or prospective standards, and to show accomplished results and other information of one kind or another.

At the present time most accounting records are made without an adequate standard with which to measure the results that the records indicate have been achieved. Certain types of records which measure accounting data in terms of dollars and cents are necessary to the conduct of a business enterprise, but such records, unless wisely interpreted, are usually of limited use in the control of a business enterprise. An illustration may be used to show the inadequacy of such records in the control of a business.

Illustration of Inadequate Records.—The manager of a factory that manufactures a large variety of products, took a contract for the delivery of 600,000 units of a product, which for illustrative purposes we may call an electric fan. The capacity of the factory was about 3500 fans per day. The contract price was based upon an estimate somewhat as shown in Table 2. The engineering department, in

TABLE 2

PREDETERMINED SALES PRICE OF A "FAN"

Direct labor.....	\$1.85	
Direct materials.....	<u>1.78</u>	\$3.63
Factory overhead.....		<u>1.41</u>
Factory cost.....		\$5.04
Selling overhead.....		1.61
Other overhead.....		2.83
Profit.....		<u>2.76</u>
Sales price.....		<u><u>\$12.24</u></u>

conference with various officials, set the factory cost upon which the contract price was based. A substantial profit was contemplated on the contract. Some months after the contract was completed the cost accounting department rendered a report in summary form somewhat like that shown in Table 3.

TABLE 3

THE "ACTUAL" COST OF THE FAN CONTRACT

*Electrical Fan Contract No. 843-23**Units: 600,000*

<i>Items</i>	<i>Amount</i>	<i>Unit cost</i>
Direct labor.....	\$1,702,921.43	\$2.8382
Direct materials.....	\$1,418,702.81	2.3645
Factory overhead.....	\$1,468,986.38	2.4483
General overhead.....	<u>\$3,518,220.00</u>	<u>5.8637</u>
Total cost.....	\$8,108,830.62	\$13.5147
Sales.....	<u>\$7,344,000.00</u>	<u>\$12.2400</u>
Net loss.....	<u>\$ 764,830.62</u>	<u>\$1.2747</u>

Before the cost was arrived at, the engineering department spent a great deal of time in studying the numerous processes in the manufacture of the fans and in actually observing the manufacture of some fans. The unit cost of the fans was summarized, but the cost analysis was very minute and showed the estimated cost of every piece as it was carried through every process. After the engineering department established the factory cost, a brief report was rendered to the sales manager and the chief executive. The cost data were then filed in the engineering department files for future reference.

The plans for the manufacture of the fans were duly filed with the production department, and the work properly scheduled for manufacture. As the work progressed the cost accounting department

received data which they required to determine cost. In due course all of the fans were manufactured and delivered, and the cost department rendered a final report on the contract. This report showed the fan contract in such a bad light that the chief executive set about to find the causes for the failure to make a profit on the contract. The engineering department said that the cost department's figures were entirely wrong, and the cost accounting department said that their figures showed the "actual" cost and that the engineering department's statement of cost was "too bad." No executive had reviewed and interpreted the costs, because they needed to concentrate on more important things, so they said.

At this point an analyst was requested to do the necessary research to find out what were the contributing causes for the loss on the fan contract, and to ascertain at what price the company could make another fan contract. Table 4 shows the estimate of cost as prepared by the engineering department and by the cost accounting department.

TABLE 4

ESTIMATE OF COST OF ELECTRICAL FANS AS PREPARED BY THE COST DEPARTMENT
AND THE ENGINEERING DEPARTMENT

<i>Items</i>	<i>Cost Department</i>	<i>Engineering Department</i>	<i>Variations Amount</i>
Direct labor.....	\$2 84	\$1.85	\$.99
Direct materials.....	2.36	1.78	.58
Factory overhead.....	2.45	1.41	1.04
Factory cost.....	<u>\$7.65</u>	<u>\$5.04</u>	<u>\$2.61</u>
Selling overhead.....	2.12	1.61	.51
Other overhead.....	3.74	2.83	.91
Total cost.....	<u>\$13.51</u>	<u>\$9.48</u>	<u>\$4.03</u>
Sales price.....	12.24	12.24	.....
Profit or loss*.....	<u>\$1.27*</u>	<u>\$2.76</u>	<u>\$4 03</u>

The analysis disclosed that there was a wide difference in the classification of the cost items. In each case the overhead was figured upon entirely different bases. Briefly, the research ascertained that the excess direct labor was due to the lack of properly trained employees in several of the fan sub-departments. Few of the girls in some of the departments had ever earned piece rates, as the company had paid these employees hourly rates. The excess of direct materials was largely the result of excess spoilage of work due to lack of trained

employees, and to the fact that the cost department had charged some material into the cost at prices in excess of cost, and some high-priced material had been used that had been carried in the stores of another plant for several seasons. The excess factory overhead was caused by a difference in the method of distributing the overhead costs to the product. The cost department had included a larger percentage of "general overhead" in the costs, and this was found to cover the estimated overhead cost of idle plants, and less profitable plants owned by the affiliated group of corporations. The plant manager reviewed the results of the research and concluded that a "substantial" profit had been earned on the fan contract, and at a slight increase in sales price to cover "overhead" a new contract was signed.

The illustration given above, among other things, shows the inadequacy of records not properly designed where dollars and cents are used without regard to a proper standard. Of course, the cost records of the cost accounting department could have been better designed and better kept, but their fundamental weakness would not have been removed by such a procedure. Unless the cost records be kept in terms of standards, results, and causes for variation, and this information be properly interpreted and "sold" to the management, the data are of little use as an aid to management.

The Budget.—The budget may serve a wide variety of purposes, and for this reason in particular cases we need to know what kind of budget is in use before the expression carries much information. Properly drawn up, a "complete" budget is a statement of a standard of attainment for the future; it is a statement of what is expected to come true, and against which performance is to be judged. The foundations of the complete budget rest upon the "future possibilities" of attainment. An adequate study of the past often yields much valuable information for the future, but it is often very easy for one to become blinded to "future possibilities" by an inadequate study and interpretation of the past as related to the future.

An incomplete budget is an incomplete statement of what is expected in the future. Such budgets are made for the purpose of getting a "general idea" of some of the results "hoped for." Such a budget should not be expected to serve as a standard for future performance. It has been shown that standards are "relative," but a poor standard is many times worse than no standard. Incomplete budgets may be made of value to management if the items which are missing may be supplied readily by the management.

There are many kinds of complete and incomplete budgets, as the reader will observe later. The complete budget should be so constructed as to serve as a reasonable standard of attainment. Unless the administrators and managers of a business have some adequate basis for knowing "what should be" accomplished, there is not much information that will be available in time to use for the most effective control of the business.

The illustration of the fan manufacturer may be referred to again to emphasize the need for knowing "what should be." If standards of attainment had not been set, the results would probably have been worse than they were. But it is of little value to have standards if there is no way of knowing when the standards are attained, and why they are not attained. If the cost data that were prepared by the cost department had been relied upon as a standard for future performance, would this have been a reasonable standard to use for management control? Despite the fact that much cost data in present use are of the same kind that the fan manufacturer received from the cost department, it must be said that such information is seldom of any real use for purposes of cost control, because it does not show why costs vary.

Accounting in Terms of Results.—It is necessary to know what has been done in order to know whether or not the results were in accordance with "expectations." This implies that results must be known in terms of expectations or standards. An accomplished fact is, for purposes of management control, of little importance as it is customarily recorded on books of account. The information is sometimes of great value for some managerial use, when proper analyses are drawn from the records. The management will generally receive some information of value for control from the customary pro-forma balance sheet and relative profit and loss statement. When the details of the business get beyond the review of the management, more and more reliance must be placed in standards and records; they become the basis for control. Records without standards are, for purposes of control, of no more importance than standards are without records; each loses its force without the other. For illustration, suppose that a purchasing agent required ten thousand tons of coal for a three-months' supply in a factory. A review of the records shows that the last four contract prices have been, per ton, f.o.b. destination, as follows: West Virginia pea, \$5.20; Pennsylvania soft pea, \$5.80; Indiana egg, \$5.10; Ohio pea, \$5.30. The cheapest offer that the

purchasing agent can now secure is \$5.70 per ton, while the average of the last four purchases is only \$5.35. A purchasing agent today, if he knows his job, would say that the average cost of a ton of coal is of no use in helping to decide upon a coal contract. The important thing is the relative price of the heat units per pound of coal that can be liberated and used in particular furnaces.

Other Standards and Records.—In addition to budgets, and accounting in terms of results, there are five additional branches of standards and records that go to make up accounting, in the sense in which the word “accounting” is used in this treatise. They are as follows: cost accounting, statistics, financial accounting, auditing, and reports. In addition to standards and records, to be effective as an aid to management, accounting should be assisted by all the ways and means that will serve to make accounting data available for use. Research to find out “what should be” is a very high type of accounting work, in certain important cases. There are different kinds of “research,” but an important phase of business research has to do with standards and with records, which are functions of accounting.

CHAPTER V

ACCOUNTING AS AN AID TO POLICY CONTROL

Functions of the Policy Corps.—In Chapter I the functions of the board of directors, or policy corps, have been set forth as:

- (1) To establish broad policies.
- (2) To judge the results obtained.

The aid which accounting is able to render the policy corps is to be discussed in the present chapter. It is not intended to convey the idea that the tasks performed by all boards of directors are confined to these two functions, because they are not. Some boards of directors act in an advisory capacity to the officers of the corporation; others busy themselves in helping to make executive decisions; other boards of directors busy themselves largely with confirming the acts of the executives of the corporation; while other boards of directors busy themselves in one way or another without much consideration of what their functions should be. For these reasons, the discussion here will follow along lines of policy control.

The principles of policy control are based primarily upon the long-recognized principle of: "separate the planning from the doing," *i.e.*, separate policy making from policy execution. If this principle be accepted as good organization procedure, the activities of the board of directors will be confined to somewhat definite lines. Of course, the chief executive may seek the counsel of the members of the board of directors as much as he chooses, but to give advice would not be a true function of the board of directors.

Object of Policies.—The main object for having policies is to confine the activities of a concern along certain lines of operation and give a plan for action. If the concern does not have a very definite plan of action, it cannot confine the activities of the executives along certain lines of operation and give a plan for action. The policies of a concern give the chief executive a more definite line of action so that he becomes an interpreter of policy and not a maker of policy. For illustration, suppose a board of directors says that the

concern is to "sell for cash." This kind of policy has a given objective, and the chief executive is not at liberty to say that thirty days' credit is equivalent to cash. If he grants thirty days' credit to particular customers he is acting outside the scope of his authority for which the board of directors can hold him responsible. If the policies of the corporation are well drawn and properly explained, the work of the executives is confined to the interpretation and the carrying out of policies and plans.

The Meaning of Broad Policies.—As used in practice, the word "policy" might mean almost anything from the "Golden Rule" to deciding upon which particular rules might be expected to be gold-laden. Broad policies relate to such broad questions as finance, marketing, procurement, labor, and other questions, and they also relate to the necessary plans that are considered essential to make the policies effective. Some of these broad policies are discussed below.

The financial policies of a concern may take a large variety of forms. Financial policies relate to such questions as the following: capital stock of various kinds—common, preferred, etc.; bonded debts of various kinds; loans payable; accounts payable; dividends; interest rates; the payment of all kinds of financial obligations. They may refer to financial standards of many kinds, to which the board of directors usually gives a great deal of consideration. Examples of financial standards are as follows: the dividends that can be paid on the common stock, the ratio of current assets to current liabilities, and other standards mentioned in Chapter VIII.

There are many kinds of marketing policies. They may refer to advertising and selling. The selling policies may relate to channels through which goods are to be sold and to the methods of selling. Advertising policies may cover a variety of subjects, from particular methods of advertising to the spending of a certain amount of money for advertising.

Some large concerns have a policy of first testing the marketability of new products on a small scale to see the results. This seems to be a fixed policy of well-known advertising agencies in handling advertising. By such a policy it is possible to correct defects in the plans before the expense of testing plans and methods become excessive. The sales possibilities are determined and the expense of securing a given amount of sales is tested. This kind of policy is necessary, in most cases, for successful marketing.

In several lines of business, the policy of "service" and of "quality" is made apparent to the customers and to the prospective customers. For example, in purchasing an automobile, the questions of quality and service are important considerations. If an automobile owner cannot get "service" for his car, the value of the automobile is greatly depreciated even if the "quality" is entirely satisfactory.

Other types of policies used in marketing goods are to be found in Part IV. The policy corps must have much expert information, and many facts before the marketing policies can be formulated for most effective use.

The question of procurement policies has attracted much attention in many lines of business. Procurement policies are the hub about which all the other policies revolve in particular concerns. In most businesses the procurement function, whether it be buying, or buying and fabrication, is a major function of the business. In a manufacturing business, among other things, the policy corps must decide upon the products to be manufactured and must "provide" the facilities for their manufacture.

The design and the quality of the product are usually matters which receive the attention of a wise policy corps. Proper machinery and equipment are important factors in the success of a modern factory. If facilities have been provided for the manufacture of a given product, it is not always possible to change the design without considerable expense or, as is sometimes the case, the discarding of much valuable machinery and plants. For this and other reasons, it may be said that the wisdom used by the policy corps in properly performing their function is exceedingly important for the success of the concern. Wise policies are often of more value in procurement than vast resources, and this may also be said about the other phases of policy determination.

A few illustrations of wise policies enacted in manufacturing may be given to emphasize their importance. The policy of mass production has made possible more economies in manufacture than any policy known to date. Of course, mass production calls for mass marketing, mass finance, mass management, and mass employment. Great importance has been attached to matters hitherto of not enough importance to be recognized as aids to economy in production. The conveyor and highly specialized and highly efficient machinery are examples of aids to mass production. Mr. Ford found that about ninety per cent of the production time was consumed in moving material from one place to another. Thus, one main policy became responsible for many

policies which make one great policy most profitable. Mass production has caused many luxuries of one period to become necessities of another period. Some of the most important examples of the economies of mass production are the manufacture of the following: iron, steel, cloth, etc., and the more recent one of automobile manufacture.

The labor policies which a concern establishes are often responsible for marked success or are causes for failure to achieve better results. Too many employers are "dollar wise" and "work foolish," to vary the wording of an old adage. Many labor policies are based upon the fallacy of dollar-wages instead of product-wages. Few policy corps have constructive policies for adequate administration of labor problems. If properly used, accounting can be of invaluable aid to administration in setting the wage policy so that the best interests of both employee and employer may be congruent. The results and the causes of an inadequate labor policy are questions that accounting should be able to answer for the board of directors.

Wages are relative, and the policy which does not fully recognize this fact is practically certain to cause dissatisfaction in the organization and loss to the concern. Some employers have pretty definite ideas as to how much a certain class of labor "should get." In their effort to keep the wage groups in "balance," they often overlook the incentives that make men anxious to turn out a greater product.

Some of the incentives which have proved effective in particular cases are here given: namely, provision for continuous employment; stock ownership; bonus and premium payments of various kinds; welfare work; works councils; thrift plans, etc. Many concerns have established labor policies which contain some of the several incentives.

The development of a constructive labor policy requires intelligent thinking and planning on the part of administration. The policy corps that leaves to management the question of labor policy determination and execution is almost certain to have cause to regret it. In particular cases, the results might be entirely satisfactory, but the general principle of organization should be adhered to in sizable concerns, because satisfactory results do not mean that the results could not have been more effective. Mr. Oliver Sheldon says:

Policies precede action; they should not be decisions on points which have arisen in the midst of action. Policy means the determination of what you or others are going to do, before you or they do it. If, therefore, the activities of a business are to be governed by the policies of those in control of the business, it is incumbent on such persons to review every prospective activity and

settle the policy in each direction, so that those who carry out the activity may have a definite objective and guide. . . . It should be published, then, to all whom it may affect and will be governed by it, in such a form that it will be always before them or immediately available for reference. Neglect in this respect may nullify the weeks of thought and debate which will have gone to the formulation of the policy. . . . The objective of determining policy . . . is to direct and guide the executive action.¹

From the foregoing it appears that policies have to do with the plans for the future operations of a business in the light of the past and of prospective possibilities. This leads to a consideration of the past, the present, and the future; this is accounting of the highest type.

Profits, the Motivating Power of Business.—Profits, the motivating power of business, are composed of many losses and many gains. If the gains exceed the losses by a more or less definite margin, all is well; if not, something “must” be done. More than seventy administrators and managers of well-recognized concerns were asked these questions: How do you judge the efficiency of your business? How is your efficiency judged? How do you judge the efficiency of those over whom you have authority? Few of the responses developed any idea of what might be an answer to the last two questions. About forty of the responses developed the idea that the efficiency of a business should be based upon a net-profits-to-capital ratio, when compared with a certain rate of interest. That is, if the rate of ten per cent be taken as the long term market rate of interest, plus the risk of the particular business; if a business earned twelve per cent, it would be making some progress. Some twenty-five responses developed the idea that the efficiency of a business is to be judged by its relative standing in the industry. That is, if the average earnings of several concerns in the same line of business be taken as a base, the efficiency of a given concern could be found; that is, it could be ascertained whether progress was being made or not. The remaining responses indicated that the administrators and managers were skeptical about any measure of efficiency. No definite conclusions can be drawn from these responses, but it is to be hoped that progress will be made until every administrator will have a definite answer for each of these questions.

Bases for Judging Efficiency.—As the word “efficiency” is sometimes used, there appear to be three concepts of efficiency; namely:

¹“Organization Manager,” Rowntree & Company, Ltd., York, England, in *Harvard Business Review*, October, 1925, p. 5.

- (1) Pecuniary gains, or money profits.
- (2) The production of goods and services.
- (3) The relation of predetermined results to accomplishments.

It has long been recognized that pecuniary gain is a basis for judging efficiency and for judging business success. From the financial point of view, the money-profits basis for judging efficiency seems to be the only basis for judging the efficiency of a business. Here the question is not how great an amount of services can be rendered for the money, but how much money can be made out of the business. Since most business men discount the future possibilities heavily, the profits that may be earned ten years hence receive but scant consideration.

Opposed to the pecuniary-gain basis for judging efficiency is that of the production of goods and services. Those who support this point of view contend that while "legitimate" profits are necessary for the continuance of services, the main aim of a business should be to produce all the goods and services possible for the charges made. It seems that those who have made the most outstanding industrial and commercial successes during the last fifty years have held this point of view. Most business men recognize its importance, but continue to strive for money profits as their central goal.

A different basis for judging efficiency is that of measuring the relationship between "what should be" and "what is." This viewpoint receives much consideration in this book and will be developed in other chapters.

How to Judge Results Obtained.—There are many different financial tests that are applied to business concerns to judge the results obtained in the conduct of business. Some of these are as follows:

- (1) The most usual criteria are:
 - (a) What were the net profits?
 - (b) What did the common stock earn?
 - (c) What dividends can be paid?
 - (d) What is the financial position of the firm?
- (2) Other criteria are:
 - (a) How nearly did the actual results come to the predetermined results?
 - (b) What were the significant causes for variation?

The board of directors generally judge results by profits. If in a large concern the common stock earns \$13.86 per share compared

with \$9.23 of last year, one need not be surprised to hear of great rejoicing over the progress made, and if dividends can be resumed, the fact will be published "to all the world." This is not intended as a criticism of the criteria, but its use from the viewpoint of a director is not so valuable as it is often thought to be. The financial position of a concern is a very important consideration for the policy corps, but the causes for financial results are of more value, for purposes of control, than the financial results themselves.

Basic Accounting Reports for Judging Efficiency.—Efficiency is a relative term, and in order to form an opinion as to whether or not a business is efficiently administered and managed, one must have a standard to use as a measuring stick. Profits as a measure of efficiency is not a reasonable guide in measuring efficiency, even though that measure is quite often applied. Of course the profits measure is often an important measure in determining the value of a business. This is often overemphasized as quite a number of investors could testify, investors who have purchased securities the price of which was determined by assuming that past earnings would continue in the future. The reason why profits are not an accurate measure of efficiency will appear presently.

The policy corps has to have ways and means by which it can record policies in a workable way, and by which it can be known whether or not those policies are properly executed. The key to the policies of a firm should be found in the budget. In this instrument should be focused all the policies of the firm; and a detailed study of the budget, and the forces back of it, should lead into the ramifications of the policies. The balance sheet and the relative profit and loss statement should show the results of achievement in the execution of policies. The causes for variation between the budget and performance should show why the policies were or were not effective. The proper presentation and interpretation of the basic accounting reports lead into many details, to some of which attention will now be directed.

The Budget Balance Sheet and the Budget Profit and Loss Statement.—The board of directors in any well-managed concern should base its decisions largely upon the probable future outcome of the business. Policies that are expected to extend into the future should be based upon future facts. A well-drawn plan for the future will lead a concern to a predetermined destination. The "actual" financial position of a business at any particular time in the past may be set forth in its balance sheet. What the financial position will prob-

ably be at a future date may be set forth in a "budget" balance sheet. A policy corps that can foresee, with reasonable accuracy, the effects of policies upon the financial condition of a concern is in a position to plan for control of the operations of the business. Some large corporations estimate their financial position for several years in advance, and draw up forecasted balance sheets and profit and loss statements for at least a year in advance of operations. For example, the board of directors of the X Manufacturing Company, manufacturers and distributors of article X, set forth their estimated financial position a year in advance. (See Table 5.) This budget is based upon a number of separate complete budgets. The sales budget, for example, calls for the sale of 112,132 units at \$15 per unit.

The policy corps of a concern, and the stockholders as well as executives, need some other standard besides actual profits for judging efficiency in operations. Very many factors enter into profits that are not given any consideration when profits are used to determine the efficiency of a business. For example, no consideration is given to competitive conditions, business conditions in particular industries, possibilities in sales, production, expense reduction, etc. An illustration may serve to bring out the point here raised. The majority stockholders of one corporation elected a majority of the board of directors who appointed the officials to manage the business. For some years the business had been earning what the majority of stockholders considered a good profit, a profit much above the average of other concerns in the same business. The minority stockholders were not satisfied with the profits earned; they thought that profits should be something over 100 per cent higher than they were at that time. The belief of the minority directors that a much higher profit should be earned was based upon the report of one of the minority directors who was a business analyst and critic. After a few years the former minority directors gained control of the concern. A budget was set to show future "possibilities" instead of past accomplishments. The necessary executive action was provided for, and within two years' time the anticipations of the former minority members of the policy corps were realized.

Where the various budgets, such as marketing, procurement, labor, management, and general expense budgets are properly drawn up, it is possible for the board of directors to approach its work with the object of setting standards of attainment for its concern. There is then something with which to compare achievement that is something

like an adjustable yardstick. As has been pointed out, achievement is relative, and in many cases only a very rough indicator of performance. A properly drawn budget, if provided with ways and means of adjustment explained later, may serve as a standard by which to judge performance. So drawn, and used, the budget becomes a useful tool for the directors. They may place authority and responsibility, and judge performance with confidence.

Budgets of the X Manufacturing Company.—The board of directors of the X Manufacturing Company set forth the anticipated financial position of the firm a year in advance in the Budget Balance Sheet, Table 5. The budget balance sheet is based upon the expected

TABLE 5

THE BUDGET BALANCE SHEET OF THE X MANUFACTURING COMPANY, AS OF A FUTURE DATE, COMPARED WITH ITS ACTUAL BALANCE SHEET

<i>Assets</i>	<i>Balance Sheets</i>		
	<i>Jan. 1, 1926 Actual</i>	<i>Jan. 1, 1927 Budget</i>	<i>Increase Decrease*</i>
Cash.....	\$ 12,420.00	\$ 52,380 00	\$39,960.00
Accounts receivable.....	120,250.00	103,626.00	16,624.00*
Inventories.....	69,330.00	76,880.00	7,550.00
Plant and equipment.....	152,500.00	164,900 00	12,400 00
Other assets.....	18,340.00	20,150 00	1,810.00
Deferred charges.....	3,860.00	4,360.00	500.00
Total.....	<u>\$376,700.00</u>	<u>\$422,296.00</u>	<u>\$45,596 00</u>
<i>Liabilities and Net Worth</i>			
Accounts payable.....	\$ 8,250.00	\$ 9,590.00	\$ 1,340.00
Accrued expenses.....	3,670.00	4,280.00	610.00
Reserves.....	28,900.00	43,720.00	14,820.00
Capital stock.....	250,000.00	250,000.00	—0—
Surplus.....	85,880.00	114,706.00	28,826.00
Total.....	<u>\$376,700.00</u>	<u>\$422,296.00</u>	<u>\$45,596.00</u>

operation of the major functions of the business, such as marketing, procurement, labor, administration, and management. The Profit and Loss Budget (Table 6) shows the expected operations of the business. The marketing forecast sets up, among other things, the anticipation of the sale of 112,132 units at \$15 each, or \$1,681,980.00. To make this many sales, an expense of \$596,542.00 is expected to be incurred by the marketing department. For the administration and management of the concern a budget of \$134,558 is provided. The other items in

TABLE 6

THE BUDGET PROFIT AND LOSS STATEMENT OF THE X MANUFACTURING
COMPANY FOR A FUTURE PERIOD OF TIME

<i>Items</i>	<i>Unit Price</i>	<i>Budget Amount</i>
Sales, from Marketing Budget.....	\$15 00	\$1,681,980.00
Cost of sales, see Table 7.....	7.76	870,144.00
Gross profit	7.24	811,836.00
Sales expense, from Marketing Budget.....	5.32	596,542.00
Administrative and General Expense Budgets.....	1.20	134,558.00
Net operating profit.....	.72	80,736.00
Add other income.....		18,420.00
Deduct other charges.....		20,330.00
Surplus net profits.....		78,826.00
Dividends to be paid.....		50,000.00
Balance to surplus.....		\$ 28,826.00
Units to be sold—112, 132.		

the profit and loss statement are based upon estimates to provide for items not covered by the other budgets.

The Procurement Budget (Table 7) shows the labor budget, the purchases budget, the factory expense budget, and the inventory budget. Each of these budgets sets forth in detail standard units, unit-prices, and standard costs, but are shown here as standard and as unit-prices. In case the directors wish to refer to all of the details supporting the various budgets, they should be able to do so. The Finance Budget (Table 8) shows the anticipated receipts and disbursements for the budgetary period. The finance budget is built upon data given in the various budgets, but it requires interpretation in terms of probable collections and payments.

When the directors of the X Manufacturing Company are asked to pass upon plans for the future, they have before them scientific facts as a basis for future action. Each of the budgets has supporting data to show how the forecast is calculated. If the directors have criticisms to make, they must be specific. General impressions cannot be embodied in the budgets. Likewise, the executive cannot explain the operations of the concern by saying simply that profits were smaller than the previous year due to poor business conditions. The directors of the X Manufacturing Company have set up standards of attainment by which they can ascertain "why" variations take place, and if the

TABLE 7

THE PROCUREMENT BUDGET OF THE X MANUFACTURING COMPANY FOR
A GIVEN PERIOD OF TIME

<i>Items</i>	<i>Unit Price</i>	<i>Procurement Budget Amount</i>
Labor Budget:		
Direct Labor Budget		\$360,250 00
Indirect Labor Budget.....		107,880.00
Total Labor Budget.....	\$3.9661	\$468,130 00
Purchases Budget:		
Direct Material Budget.....		190,190 00
Indirect Material Budget.....		80,940.00
Total Material Budget.....	\$2.2971	271,130 00
Factory Expense Budget.....	\$1.0605	125,174.00
Total Procurement Budget.....	\$7.3237	\$864,434.00
Inventory Budget:		
At beginning of the period:		
Finished units 4327 @ \$8.22.....		\$ 35,567.94
In process.....		20,137 60
Raw materials.....		13,624 46
Total inventory at beginning.....		\$ 69,330 00
At end of period:		
Finished units 5900 @ \$7.60.....		\$ 44,840 00
In process		21,327 40
Raw materials.....		10,712.60
Total inventory at end.....		\$ 76,880 00
Net deduction from Procurement Budget.....		\$ 7,550.00
Net total.....		\$856,884 00
Depreciation provided.....		13,260.00
Net cost of goods sold, to Table 6.....		\$870,144.00

variations are not due to conditions over which the executives and employees have no control, it is possible to place responsibility with assurance that it is placed properly. In a like manner, it is possible to give credit where credit is due. In the following chapter, reports will be rendered to the board of directors of the X Manufacturing Company to show the stewardship of the executives to the directors.

TABLE 8

THE FINANCE BUDGET OF THE X MANUFACTURING COMPANY FOR
A GIVEN PERIOD OF TIME

Receipts

Cash Balance, January 1, 1926	\$ 12,420.00
Expected to collect:	
Accounts receivable	120,250.00
Sales, per Marketing Budget.....	\$1,681,980.00
Less: accounts receivable.....	103,626.00
Bad debts	11,500.00
Total deductions	115,126.00
Net collections from sales.....	1,566,854.00
Other income.....	18,420.00
Total receipts and cash balance.....	<u>\$1,717,944.00</u>

Disbursements

Accounts payable.....	\$ 8,250.00
Accrued expenses.....	3,670.00
Machinery and Equipment Budget	12,400.00
Sales expense, per Marketing Budget.....	\$ 596,542.00
Administrative and General Expense Budget....	134,558.00
Total.....	\$ 731,100.00
Less: Accounts payable.....	9,590.00
Accrued expense less deferred charges...	3,780.00
Depreciation.....	1,560.00
Total deductions.....	\$ 14,930.00
Procurement Budget, Table 7.....	864,434.00
Other assets.....	1,810.00
Other deductions.....	8,830.00
Dividends.....	50,000.00
Cash balance, December 31, 1926.....	52,380.00
Total disbursements and cash balance.....	<u>\$1,717,944.00</u>

How to Control Future Operations.—In a well administered concern the policy corps will not be asked to pass upon policies for future operations until the past operations have been set forth in terms of standards previously set. Since it is possible to predetermine results rather accurately in advance of operations, in many lines of business, the affairs of a concern can be carried on smoothly, and, to use a figurative expression, without having to apply the brakes

sharply at one point and presently surge ahead at full speed. The waste in industry due to this lack of intelligent foresight is very great, most of which lies at the door of administration. Too many administrators and managers do not assume their just responsibilities; they do not secure sufficient facts upon which to base intelligent decisions. Orderly administration cannot take place unless facts can be secured upon which to make decisions. When the board of directors use properly interpreted facts as a basis for its decisions, the losses due to lack of administrative control will be greatly reduced. The facts that are needed are those which will enable the directors to set up budgets that will indicate with reasonable accuracy what will probably take place in the business during a given period, preferably not less than six months in advance of operations. The accuracy with which results can be predicted usually depends upon the type of business. It has been found possible to predetermine budgets which subsequently come out so close to the budget that the discrepancies were negligible. Briefly, the way to control future operations is to predetermine results and to provide executive action to carry out the predetermined results.

Executives as Directors.—In many of our large corporations it is the practice to make executives members of the board of directors. The president or chief executive is often the chairman of the board of directors. Whenever an executive becomes an administrator he is playing a dual rôle in the concern. When the ownership of the concern is under the control of such officials there are good reasons why this kind of situation is permissible. Some writers advocate that the board of directors should be composed of executives who are in the business and presumably know its needs better than outsiders. This view has many good points. In most sizable concerns the chief executive is a planner and not a doer. This is likewise the case with several of the minor executives. In many respects "planning" is separate from "performance" but not entirely so, in such a case. The chief executive is usually the chooser of the major executives. If the chief executive be allowed to dictate the policies of the concern, to plan its activities, and to pass upon its accomplishments, the concern may be well coordinated in some respects, but the legislative and the executive functions will not have that balance which we in America think necessary for proper organization.

Based upon the principle of business organization that the policy-making function should be separate from the executive function, it is apparent that the director of a business enterprise, where ownership is

TABLE 9
COMPARISON OF THE PRESENT CALENDAR WITH THE INTERNATIONAL
FIXED CALENDAR

MONTH	1st WEEK							2nd WEEK							3rd WEEK							4th WEEK							5th WEEK							6th W.K.	S M	Saturdays	MONTH	
	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S					
Jan	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31						Jan			
Feb				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28						Feb			
Mar								5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31				Mar		
Apr								1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30			Apr
May				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31				May		
Jun								4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30				Jun		
July								2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31			July
Aug				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31				Aug		
Sep								3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30				Sep	
Oct								8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31							Oct		
Nov				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30					Nov		
Dec								3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31				Dec

THE PRESENT CALENDAR

MONTH	1st WEEK							2nd WEEK							3rd WEEK							4th WEEK							No 5th or 6th WEEK
	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	
Jan	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	
Feb	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	
Mar	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	
Apr	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	
May	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	
Jun	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	
Sol	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	
July	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	
Aug	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	
Sep	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	
Oct	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	
Nov	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	
Dec	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	

Proposed new month

29 "Year-day"

'THE INTERNATIONAL FIXED CALENDAR

scattered, should not occupy a dual capacity as director and executive. The executive and members of the organization may be of invaluable assistance to the directors in assisting in the formulation of policies, but the policies of the business should be established by those who have a bird's-eye view of the situation.

Interpretation of Accounting.—The board of directors will usually interpret the accounting reports in somewhat the same manner that the controller and the chief executive interpret reports. There are many types of data to be interpreted, and for that reason the presentation and interpretation of the various data must be left to the various chapters of this book to develop. For example, the various types of legislation passed by government agencies affect the policies of a business. This is a problem in external coordination and is dealt with in Chapter XXIII. The board of directors should use accounting data of the highest type, and this data consists of standards and records, and ways and means of making standards and records effective. Many factors must be considered in the interpretation of accounting data. The calendar question is illustrative. Other factors are as follows: the basis of valuation used in accounting, the comparative economic position of the concern with other concerns, and the present prospects for future earnings.

The Calendar Question.—The effects which our present calendar has upon the interpretation of accounting data is not recognized generally in business. When allowance is made for Sundays and holidays the business days of months vary as much as about 20 per cent.¹ Such variations make it impossible to compare accurately the data of one month with data of another month unless the calendar variation is removed. The removal of such variations takes time and effort so that most executives do not consider them in trying to interpret reports. The result may be that one month appears to be better than another, while as a matter of fact it is worse because of calendar variations. In some businesses, the sales vary with the days of the week. Since every month does not have the same combination of week days, an adjustment must be made to cover this variable, if a close comparison is to be made. Because of these and other defects in our present calendar, the League of Nations now has under advisement the Cotsworth Proposal for Calendar Reform. The proposed International

¹ M. B. Folsom, Assistant to the Chairman, Eastman Kodak Company, Bulletin No. 26 (F. E. S.), American Management Association, 1928. See also, "Do We Need Calendar Reform?" by George Eastman of Eastman Kodak Company.

Fixed Calendar is shown in Table 9. All months are composed of four weeks. Every day of the week would have a fixed cycle of dates. To illustrate: the Mondays of each month would fall on the 2nd, 9th, 16th, and the 23rd. In the present calendar the days of the week shift badly on the calendar. A new month, named Sol, would be inserted between June and July. The last day of the year is called "year day," which would be an additional Sabbath day. Every fourth year an additional Sabbath day would be inserted between June and Sol. It is also proposed to make all holidays fall on Monday. Such improvements will be beneficial in many directions and should become effective. After wide criticism no fundamental objection has been found to the proposed calendar.

CHAPTER VI

ACCOUNTING AS AN AID TO THE CHIEF EXECUTIVE

Authority and Responsibility.—In the minds of many people, the chief executive is an Atlas who bears upon his shoulders a World of authority and responsibility. Some people think that the will of the chief executive must be done or some of his employees must find employment elsewhere, because the chief executive is responsible for the actions of those whom he employs. Some people visualize the chief executive as the big boss who comes in five days a week at 10 A.M. and quits for the day at 3 P.M., and never appears for work on Saturday. These three ideas of the chief executive are distorted and do not show the authority and the responsibility attributed to the functions of the chief executive.

The authority and the responsibility that the chief executive receives from the board of directors is very different from what one should get by reasoning from the strictly legal point of view. The reason for this is quite simple. No administrator, executive, or employee can be expected to have effective authority or effective responsibility for anything which is beyond his individual control. This limitation upon the authority and the responsibility of the chief executive emphasizes the necessity for the effective placement of authority and of responsibility in the organization.

Of course it is not intended to convey the idea that the executives of many businesses have not been discharged, or honored, as the case may be, because things happened over which they had no effective control. For example, one instance is on record where a sales manager was discharged because he could not sell at a profit the products made by the factory. A market analysis made by competent analysts, among other things, disclosed that the product was poorly designed, and that the demand which existed and which it was practicable to create for the better-designed commodity was insufficient to make a profit when more than fifty-five per cent of the plant capacity was used. In another case, a salesman was very "successful" in selling in a certain western state. As a result of the achievement he was made sales manager

of the concern. Later, an advertising survey was made and the analysis disclosed that, to the surprise of the chief executive, the sales manager had made his record in the best territory and had not made as much of his opportunity as the salesman in a neighboring territory.

In a sizable concern, the chief executive will require a corps of assistants to help in carrying out his numerous functions. Some of these assistants may occupy staff positions, while others may be executives—such as the controller, for example. Whatever the particular form of organization, the assistants should be well supervised and the responsibility defined as clearly as possible.

The Functions of the Chief Executive.¹—From the viewpoint of management control developed in Chapter I, the chief executive has two main functions which are as follows:

1. The setting of standards by which performance may be judged, and
2. Providing ways and means for knowing whether those results are secured, and for ascertaining any cause for variation between the standard and the results.

Each of these two main divisions of the chief executive's functions may be subdivided into several parts. These main functions and some of the subdivisions will be treated below.

The Function of Setting Standards.—The chief executive receives from the policy corps the necessary authority to execute the policies of the business. He accepts the "responsibility" of management. What this responsibility is may be seen below. The function of setting standards is broad and may be divided into the following functions:

1. The interpretation of the policies of the business in terms of the particular problems of the enterprise.
2. The presentation of objectives for the business in terms of plans, and the modification of the plans or the objectives whenever conditions appear to warrant such modifications. The objectives of the business should be expressed in properly drawn major budgets, supported by the necessary detailed budgets.
3. The employment of such major executives as are required to execute the major functions of the business.

¹ For an enumeration of the functions of the chief executive, see "A Technique for the Chief Executive," by John H. Williams in the *Bulletin of the Taylor Society*, Vol. VII, p. 47.

4. The inspiration, leadership, and development of the major executives, and a source of refuge for counsel. To be the final source for the adjustment of such matters as may not be agreeably settled by other executives.

These four major functions of the chief executive in setting standards will be briefly discussed.

If the chief executive does not set definite standards for the various executives, he will not have an adequate measuring-stick by which to gauge the results which they accomplish. The executives who are being judged should be informed as to what is expected of them; otherwise they have no basis for knowing whether or not the criticism is just. Likewise they have no way of knowing what is expected of them. There are many ways that the chief executive can use to convey to the executives the policies and the plans of the concern, and the means by which their progress is to be evaluated. Personal contact is possibly the most generally used method of conveying this information. Sometimes more than personal contact is needed to make the information effective. Everything necessary for the understanding of policies, plans, and methods of judging efficiency should be written and the written information supplemented by oral conversation where necessary. The oral conversation should not add new material that is not later added to the written matter. The main purpose of the conference is to assure the chief executive that the ideas expressed in writing are understood properly.

Interpretation of Policies.—The policies of the enterprise should be established by the legislative or policy corps, but the interpretation of these policies in terms of the concrete problems of the enterprise should be left to the chief executive or to the properly constituted executives.

The policies of the concern should be in writing so that they may be understood readily by those who are to apply them in the conduct of the business. Likewise the interpretation of the policies should be in writing and made available to those who require the data for the execution of their work, or for information. The pertinent facts in particular cases which give rise to the interpretation of policies should be written and made available. The reasons for the interpretation of policies in certain ways should be stated clearly.

An objection to this kind of procedure is that it requires too much time and expense to write out the necessary information, and consumes too much of the executive's time in consulting the "experience book."

The criticism, however, leaves out of consideration the saving of time and of expense that results from having found "the one best way" to do things, and having the information where it can be made use of without having to make a risky decision on the spur of the moment. The experience of the concern, and that of others, is thus made available for use instead of being stored in the brain of some executive, where it may be destroyed by death, resignation, forgetfulness, lack of perspective, or indisposition to make it available for use. If the policies and their interpretation are made available for use, the enterprise will be in a position to make the best use of wise leadership. In this manner, the art of leadership may be transmitted to others through the science of management. From such a procedure it appears that the leaders who have been able to benefit by the experiences of others should be better leaders than their benefactors.

Policies in Terms of Objectives.—The chief executive must translate the policies of the business into objectives which he expresses in terms of plans for action. The policies which the policy corps establishes for the business may not be capable of full expression in the form of expected results. Wise policies are, however, often capable of accurate expression that will hold good over a number of years. For this reason the board of directors should set up standards for performance as far in advance of operation as seems feasible. These standards will be in terms of the objectives of the business.

The standards which are set up for a business are often subject to revision before the predetermination becomes an adequate standard. In predetermination in business there are usually some factors over which no adequate control can be had, so that an adjustment of the standard must be made before an accurate appraisal of results can be completed. For example, profit standards may be subject to the influences of "general business" conditions. If the forecast of "general business" conditions be in error, the standard must be adjusted to take account of this variation.

The chief executive must coordinate properly the various objectives of the business. Coordination has to do with the proper balance in activities. Every major function and its minor functions should be in balance in the organization. Coordination is obtained from the intelligent use of standards and records. Business success is seldom possible, in a sizable concern, unless the proper accounting tools are used to help the chief executive keep the various activities in balance. The

failure of several large enterprises has been attributed to the lack of coordination, and much waste in business is caused by it.

In translating the policies of a business into objectives, ways and means must be provided to express the objectives in terms of money, men, materials, and machines. To accomplish this, the chief executive must be assisted by a corps of executives and assistants. Each major executive should have standards by which performance may be judged. The budget is a serviceable means for expressing standards in an easily comprehensible form. Each major budget should be supported by properly drawn main budgets, so that every activity of any significant magnitude may be controlled properly.

Since the chief executive is the official through whom the various functions of the standards and the records are performed, a question may be raised as to how the policy corps can set up standards for performance. It may appear that the policy corps would simply approve the budget and accept the chief executive's explanation of the variations in the former standards. The board of directors that follows such a course is not performing the function of a progressive policy corps. The tentative budget forecast should be prepared by the chief executive, the executives, and the assistants, and it should be the best forecast that they can make. If the board of directors is composed of able administrators, they will soon be able to tell whether or not they wish to commit themselves to the proposed program. If the proposed program is at variance with the data which the administrators have, they should not hesitate to revise the budget in the light of the proposed standards. It is for this reason that the chief executive should not be the chairman of the board of directors in a well-organized concern. The administrative corps that establishes general policies without reference to specific results expected, is not, from the viewpoint of the organization principles here used, performing true functions.

Employment of Major Executives.—The chief executive in a sizable concern has need of a few major executives to coordinate the work of other specialists. Many chief executives attach a great deal of importance to this function of selecting major executives. The century-old cry of "Come up, there is plenty of room at the top!" has not made a great deal of impression upon many minor executives, if we may be permitted to judge from the apparent consensus of opinion among chief executives of today. They often complain of the scarcity of good major executives.

There are three types of policies, with regard to the employment of major and minor executives, which are set forth as follows:

1. Selection from within the organization.
2. Selection from without the organization.
3. Selection from within or from without the organization.

Some large organizations have a very definite policy of selecting executives from within their own ranks. In such an organization the chief executive may have a very limited number from which to make selections. Since promotion is most generally very gradual, and opportunities are offered to those who have seniority in service and are reasonably good executives, the chief executive usually finds himself choosing his major executives from those who have been with the concern from twenty to thirty years. An executive in a smaller concern, no matter how good, would find no encouragement if he offered his services to the chief executive or a major executive of such a concern. In fact, he might not be able to get into the organization under any conditions. This is likewise largely true of staff men and technicians of various kinds.

A fundamental criticism of such a policy is that many of the most promising junior executives leave such a concern as soon as they have a good opportunity to do so. Promotion is entirely too slow for them. This leaves the concern with a smaller and smaller number of executives from which to choose higher executives. The concern which follows such a policy hopes to create a morale in the organization that will offset this fundamental criticism. Whether it does or not, this criticism is largely an individual problem for accounting research and executive appraisal.

Some concerns so seldom promote those within the organization to high ranks that such a concern may be said to promote from the outside of the enterprise. This is often the policy of fast-growing and highly profitable concerns. The chief executive of such a business is almost constantly on the lookout for those whom he believes will be able to execute his plans with success. This kind of policy causes a heavy drain upon the executive personnel of other concerns. A number of businesses that have grown into national prominence during the last ten years have followed this policy. This type of policy is likewise defective if employed for too long a time.

The policy of employing executives by specifications is a third type of labor policy. Here the chief executive is not so much

interested in whether the executive comes from within or from without the organization as he is interested in the qualifications and probable success of the prospective executive.

It may be observed that a study of the policies of over fifty of our sizable corporations reveals that without exception the corporations, while getting established, followed the second policy. After the business had increased to considerable magnitude, the third policy was pursued. The concerns studied, which have advanced to the rank of great corporations, now employ the first policy mentioned above.

Whatever the policy pursued as to where the executives are to come from, the chief executive still has the problem of selecting the major executives to assist him in formulating and executing the plans. The chief executive, if his accounting information has been properly presented, will have a good check upon certain of the qualities of the executives that come from within the organization. The executive that comes from without the organization can be tested in the same way.

Leadership of the Chief Executive.—In a sizable concern, a large portion of the chief executive's time and energy will be devoted to his major executives. The larger plans of the concern cannot be carried out, in a satisfactory manner, unless the full cooperation of each major executive is secured. This cooperation is secured best by leadership. It can be obtained usually from major executives by the presentation of plans which are supported by good reasons. The major executives are usually people who have considerable pride in their work. Best results usually come from inspiration. The drive method is destructive of executive pride and is not the attribute of a true leader.

Sometimes the chief executive has a great deal of trouble in getting major executives that approximate his desired specifications. There is a constant change in the personnel of major and minor executives. A considerable amount of the chief executive's time is spent in training major executives for their jobs. Much time and energy will usually be conserved if the organization is established along the proper lines. Executives should be developed along specialized lines as far as it is possible to do so. This makes for economy in operation, and makes the specifications for major executives less imposing.

In the conduct of a business there are many problems that are discouraging which the major executives must face. The major executives need some one with whom they can talk of their problems, and from whom they can get counsel. This job falls upon the chief

executive. An illustration will make this point clear. A production executive in charge of the drilling operations of an oil company became very discouraged and offered his resignation. The chief executive already knew his troubles. The production man was interested solely in getting wells drilled. He never made use of records and had a bitter prejudice against them. The company's books showed many thousands of dollars invested in equipment at certain locations which was not there, and much development work in other locations with very little equipment. A physical inventory of all equipment was several hundred thousand dollars short of what the chief executive thought it should be. His methods of operation cost the company between four and five hundred thousand dollars of unnecessary expenses, which the chief executive wanted to stop. The manager in charge of drilling was, however, too valuable to lose, if his methods could be changed. The chief executive detailed his weakness to him but offered to keep him if he would correct these weaknesses. This was done with such tact and leadership ability that the manager in charge of production resolved to make good with the chief executive. He agreed to stay with the company six months longer, during which time a member of the planning and records department was to be with him constantly, while at work, and help develop his knowledge in phases of the work in which he was weak. By the time the six months were up the production manager had been sold thoroughly as to the needs of plans which could be used as a check on performance. His methods now permitted him to do his job—the drilling of wells in a hurry—better than ever before, and at a very considerable saving to the company.

Sometimes problems arise from the interrelated activities of a concern that require the attention of the chief executive. For example, the manager of marketing and the manager of personnel may disagree upon the methods of training salesmen. This could cause much trouble if the chief executive did not secure the facts back of each manager's contentions and, with these facts, adjust the misunderstanding between the major executives.

The Records Function.—In order that the various operations of the concern may be checked against the standards, it is necessary to provide proper ways and proper means for ascertaining the results of operations in terms of the standards. From records so kept, it is possible to ascertain causes for variation between standards and accom-

plishments. In performing the records function, the chief executive should do the following:

1. Keep informed as to the accomplishments of each major executive; to see that the business is properly coordinated, and to see that each major executive understands the relationship of each major function of the business to the business as a whole.
2. Appraise the accomplishments of each major function of the business in terms of the standards set. A proper allowance for adjustments in the standard should be made where necessary.

A duty of the standards and the records function is to supply the information on which executive decisions are to be made. This information should be in a readily understandable form, preferably on charts and graphs, and properly supported reports.

Unless the accomplishments of each major executive be kept in terms of the standards set, it would be practically impossible for the chief executive to gauge intelligently the results accomplished by each major executive. The business as a whole may be making satisfactory profits despite the fact that many operations may be carried on in a most unsatisfactory way. This enables the chief executives to see how accomplishment compares with standards, and to concentrate his attention on the weak places in performance. The major executives sometimes boost their own functions so that they lose the proper perspective in the business. The chief executive should not be unmindful of this problem of internal relationship. When records are kept which show the relative position of each department of the business, the chief executive will have little difficulty in getting the different executives to see the interrelationships that exist.

The real basis for action by the chief executive is a scientific knowledge of the facts, which must be properly interpreted in the light of the fundamental policies of the business. The standards and records function should provide the chief executive with the basic data upon which executive decisions are to be made.

Organization for Control.—The chief executive, in carrying out his functions, must so organize the various functions of the business that the standards and records can be made and used in an orderly manner. The type of organization may proceed along functional lines somewhat as shown in Figure 11. The chief executive makes

use of standards and records to weigh the procurement, the personnel, and the marketing functions. This is done by a series of scales which will register results in terms of standards. Each of these major functions may weigh the various functions into which it may be subdivided. The standards and the accomplishments of the chief executive, and those under him, may be set forth in the standards and records. Through the controller the chief executive accomplishes much of his work; namely, the appraisal of the results to be accomplished and the results accomplished. Through the controller he has ways and means

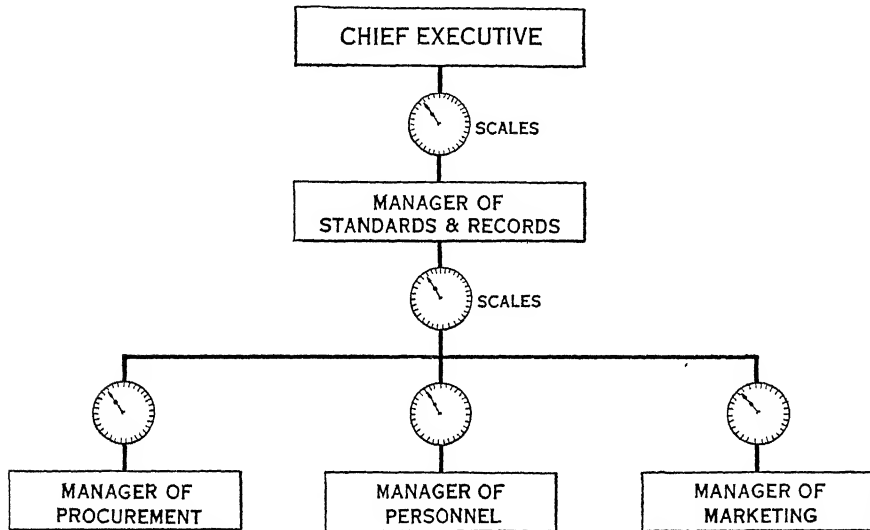


Figure 11. Top Organization for Control.

for knowing whether or not the plans were carried out, together with the causes for variation between the standards and the results.

The chief executive can see by his scales whether or not those under his direction are performing their duties properly. By this means the chief executive can keep the various activities of the business in balance. The finances of the business are here conceived of as being a part of standards and records. The organization of the business should be such that the three major functions may be recorded in terms of standards, and financial standards are exceedingly important in the conduct of a successful business.

Reports for the Chief Executive.—The particular kinds of reports which the chief executive requires to keep himself properly informed will vary considerably according to the type and the size

of the business. In a fairly large concern, the chief executive may require monthly budgets of several kinds; namely, budget of marketing, budget of procurement, budget of labor, budget of cash requirements, and the corresponding statements of attainment. These statements should analyze critically all of the different operations in comparison with the forecast. The chief executive may also require various kinds of statistical reports so that he may be able to determine whether or not the forecasts of performance are properly set forth in performance.

The chief executive requires all of the separate budgets combined into two main budgets, and performance should be in terms of the budgets. The balance sheet budget and the profit and loss budget provide the chief instruments for the control of an enterprise. A chief executive who does not have a fairly good idea of what is likely to happen to the business in the not too distant future, has no adequate means of control of his business. Forecasts must be compared with accomplishments so that the chief executive can know whether or not his means of control are effective.

The contents of the reports which the chief executive receives should be such that he may get an immediate visual picture of what has and is taking place. A busy executive does not have the time to interpret a report that requires a considerable knowledge of the exact nature of the figures back of the report. For this reason, the controller who is able to interpret the reports which he prepares will find his services of a greater value to the executives than a controller who is not able to interpret the data which he prepares. Some chief executives will not give any consideration to statements and reports that have not previously received the consideration of the controller. Such a precaution on the part of the executives would save many costly mistakes due to basing decisions upon inadequate, false, and otherwise defective information. Since reports come indirectly to the chief executive from many sources, the chief executive should be cautious to see that each report has received adequate consideration from various technicians before he makes his decision in the matter. For example, suppose that the chief executive is urged by the factory manager to increase the production of a given article because the latter thinks that it could be done at a profit. This is a question which would affect other functions of the concern, and the chief executive should not be asked to pass upon the question until the reports of sev-

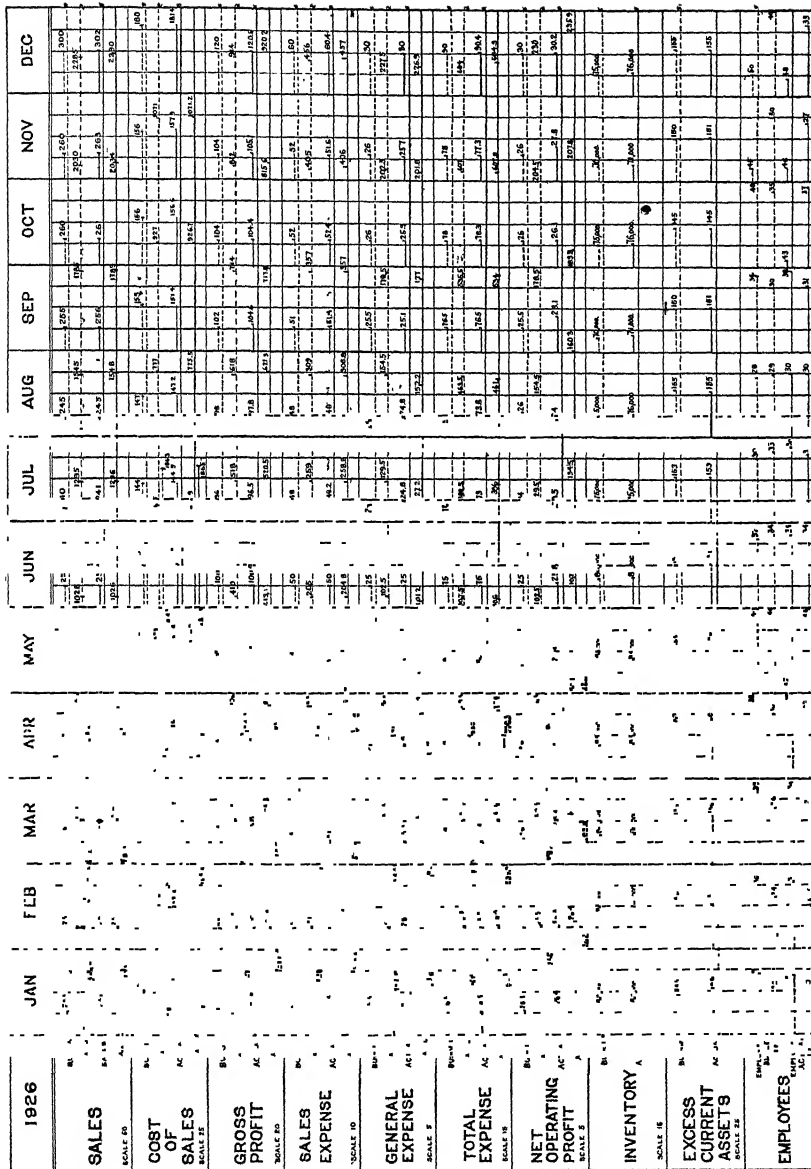


Figure 12. The Gantt Chart.

eral interdependent functions have been analyzed and stated in the light of the business as a whole.

Charts for the Chief Executive.—Since the chief executive is interested mainly in the relationships in management, charts and graphs may accomplish this purpose better than any other means. Details in reports often tend to obscure the main features and facts which the report was intended to amplify. Charts may be prepared which will show the executive more at a glance than he would secure from a very lengthy report even if he took the time to read it thoroughly. Some executives prefer to chart the main facts of the business and refer to these charts when they wish to refresh their memory of certain facts instead of the reports from which the charts were constructed.

The Gantt Progress Chart is a useful chart on which to chart certain budget and performance data. The horizontal axis of the chart may represent one or more facts; the same is true of the vertical axis. Thus the horizontal axis may represent time, budget forecast, and accomplishment, as shown in Figure 12. The horizontal performance lines show the relationship in time of accomplishment to the forecast. Here the sales, cost of sales, gross profits, sales expense, general expense, and net operating profit is shown as a budget and as a performance. The same is true for the inventory and excess current assets. Any other type of progress data that the chief executive may desire charted can be shown on such a chart. Such a chart shows the plan in comparison to performance, and in a broad way the co-ordination of the activities is brought to the attention of the chief executive.

The arithmetical and the semi-log charts are shown in Figure 13. The arithmetical chart is drawn so that equal distance on an axis will represent equal values. Thus, each space between 0 and 150 is of equal value. The semi-log chart is based upon logarithms (Y axis here) and equal space does not represent equal value. Observe that the sales increased from 100 to 150 or 50 per cent; that cost increased from 50 to 100, or 100 per cent; that the profits decreased from 30 to 10, or 66 $\frac{2}{3}$ per cent. On the arithmetical scale the cost and the sales lines are parallel, while on the semi-log chart they are not. The costs and the expense lines are parallel on the semi-log chart; but on the arithmetical scale there is a wide difference in slope. From this it will be observed that the semi-log chart shows increases or decreases in percentages readily, while the arithmetical chart obscures

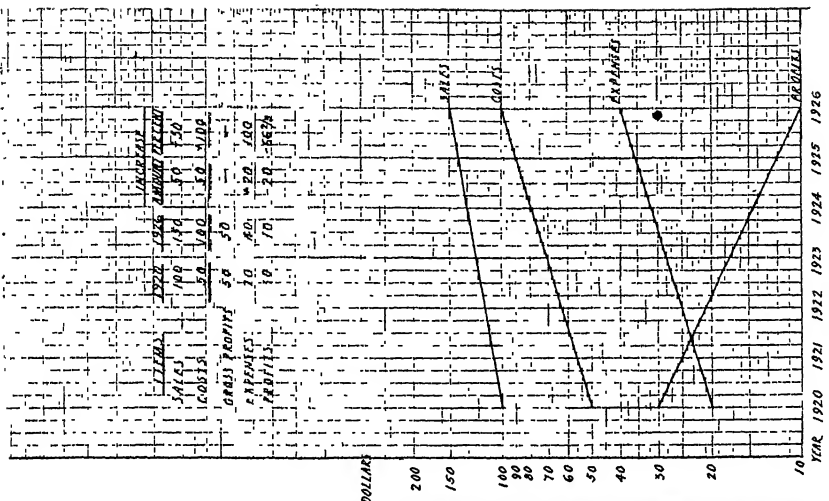
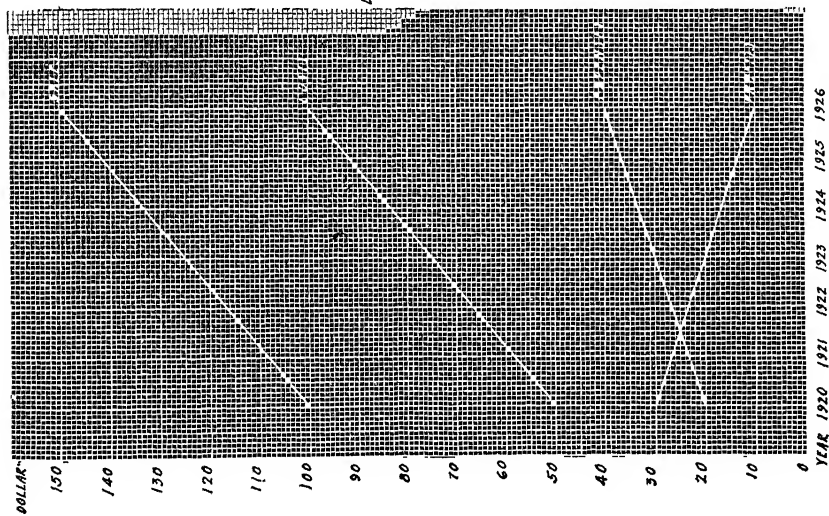


Figure 13. The Arithmetical and Semi-log Charts.

this fact. Each of these charts has important uses. In comparing absolute amounts, the arithmetical chart is the one to use. If relationships are more important than amounts, which is often true from the viewpoint of the chief executive, the semi-log chart should be used. If, for example, sales and costs were to increase in a straight line, they would cross in 1934 on the semi-log chart, while on the arithmetical chart they would remain parallel. Observe the slopes of the lines on the two charts.

It is relatively easy to draw erroneous conclusions as to just what is happening in a business when the arithmetical charts are used, unless considerable care is taken to watch the percentages as well as the amounts on arithmetical charts.

Mr. Erskine¹ says of small concerns:

They think only of amounts and never in percentages. When sales can be increased by an increase in the amount of expenses without increasing the expense ratio, they seldom appreciate the opportunity. When new machines or new methods will justify the scrapping of old equipment, they may never realize it.

One remedy for this failing is the wise use of the proper chart.

Interpretation of Causes for Variation.—In the previous chapter the board of directors set up a budget for the guidance of the chief executive. The chief executive should render a report covering the operations in terms of the budget, and show the causes for failure to secure the results forecast. In this case the forecast is taken to be the standard of attainment, and the causes for failure to secure the results forecast are to be accounted for in units, prices, and amounts. It should be emphasized that the "causes" for failure to accomplish the predetermined results are not necessarily the "final" causes. In some cases, "causes" may mean that an accounting has been made of the reasons for variation. For example, if the sales forecast, Table II, is for 380 units at \$650 each, or \$247,000, and the performance is the sale of 385 units at \$650 each, or \$250,250, the "causes" for variation is that 5 additional units at \$650 each has been sold. This is not an explanation of "causes" for the sale of five more units than were forecast. The reason for this latter variation may be accounted for as partly due to failure to predict business conditions properly, and partly to superior salesmanship, and other causes over which the business has no control. Take, for example, the cost of sales. Here

¹ A. R. Erskine, president, the Studebaker Corporation, *Manufacturing News*, May 3, 1924, p. 23.

the "causes" for variation, as shown in Tables 13, 14, and 15, are numerous, each item of which may be shown in variations due to units and prices. If it is desired to know why labor varied from standard, the "causes" may be found as due to hours or wages, or both hours and wages. If we wish to know why the hours were more, it may be shown that the causes for this variation were due to increases or decreases in controllable and uncontrollable items such as lack of materials, lack of repairs, lack of help, lack of instructions, or due to failure in performance. The chief executive should know, within practical limits, the final causes for every variation that may take place between the budget and the performance, and an appraisal should be made of each cause to which a value can be assigned. This will serve as a basis for rating performance. The directors, too, will be interested in knowing the final cause for variation, and the chief executive should be able to explain the ultimate causes of the significant variations to them. The causes for variation should be as-sayed against those responsible for the variations, whether they be major or minor executives, employees, or conditions over which neither executives nor employees had control. It is beyond the scope of this chapter to demonstrate how this may be done in certain cases, but the causes for variation between the budgets and the actual performance will be illustrated in the case of the X Manufacturing Company.

The X Manufacturing Company.—In Table 10, the budget balance sheet and the actual balance sheet is set forth. The relative profit and loss statements are shown in Table 11. The forecast of surplus net profits was \$679.22 in excess of accomplishment. This was brought about by an increase of sales of \$3250, an increase in the cost of sales of \$1,797.82, an increase in sales expense of \$1664, an increase in management and general expense of \$267.50, which resulted in a net operating profit decrease of \$479.32. These variations in net profit are explained in Table 12, as due to units and to prices. Thus, the operating profit was increased by \$250.53 due to an increase of five units in sales, at standard prices. The operating profit was decreased by variations due to price increases over standard prices in the amount of \$729.85. The variations in operating profits were due to several causes. Table 14 shows the variations in the procurement items, and Table 13 shows the variations due to variations in the cost of goods sold. For example, the reason why depreciation varied is that a standard rate of \$5.10 per unit was charged, and eleven

more units were produced than were forecast. There were six additional units in the final inventory, and the actual cost of the items in the final inventory was \$73.60 in excess of the forecast standard cost.

The procurement statement, Table 14, shows that the additional units at standard cost was \$3,565.32 and that price variations amounted to \$224.56. It should be observed that the "actual" figures represent many increases and many decreases. For example, the direct labor was \$1,546.42 in excess of the standard. The cause for this variation was that 11 additional units were produced, which, at standard cost, amount to \$1,313.84; and the 411 units were produced at \$0.58, or \$232.58, in excess of standard. Are these "actual" causes for variation? No, they are not; because no consideration is given to the increases and decreases in actual cost over standard cost. To determine ultimate causes the labor budget would have to be analyzed by departments, and possibly by individual workmen, to see that the results they obtained were in accordance with the standard, and that any "causes" for variation were observed. As an executive tool, this latter analysis is of the greatest importance. For the most part, this

TABLE 10
THE COMPARATIVE BUDGET AND ACTUAL BALANCE SHEETS OF THE X
MANUFACTURING COMPANY

<i>Assets</i>	<i>Balance Sheets</i>			
	<i>Jan. 1, 1927</i> <i>Actual</i>	<i>Feb. 1, 1927</i> <i>Budget</i>	<i>Feb. 1, 1927</i> <i>Actual</i>	<i>Increase</i> <i>Decrease*</i>
Cash.....	\$ 12,420.00	\$ 32,078.20	\$ 26,725.61	\$5,352.59*
Accounts receivable.....	120,250.00	103,850.00	104,790.01	940.01
Inventories.....	69,330.00	74,532.65	78,134.81	3,602.16
Plant and equipment.....	152,500.00	152,500.00	152,500.00	-0-
Other assets.....	18,340.00	19,200.00	19,210.00	10.00
Deferred charges.....	3,860.00	4,200.00	4,315.00	115.00
Total.....	\$376,700.00	\$386,360.85	\$385,675.43	\$ 685.42*
<i>Liabilities and Net Worth</i>				
Accounts payable.....	\$ 8,250.00	\$ 9,300.00	\$ 9,325.50	\$ 25.50
Accrued expenses.....	3,670.00	3,800.00	3,801.60	1.60
Reserve, plant, and equipment	28,900.00	31,310.00	31,366.10	56.10
Capital stock.....	250,000.00	250,000.00	250,000.00	-0-
Surplus.....	80,560.00	86,450.85	85,771.63†	679.22*
Overabsorbed burden.....	5,320.00	5,500.00	5,410.60	89.40*
Total.....	\$376,700.00	\$386,360.85	\$385,675.43	\$ 685.42*

† See Table 11.

TABLE 11

THE COMPARATIVE BUDGET AND ACTUAL PROFIT AND LOSS STATEMENT OF
THE X MANUFACTURING COMPANY

Items	January, 1927 Budget			January, 1927 Actual			Increase Decrease
	Units	Price	Amount	Units	Price	Amount	
Sales.....	380	\$650 00	\$247,000 00	385	\$650 00	\$250,250 00	\$3,250.00†
Cost of sales.....	380	329 0925	125,055.15	385	329 4882	126,852 97	1,792.82
Gross profit.....	380	320.9075	121,944 85	385	320 5118	123,397 03	1,452.18
Sales expense ..	380	225 00	85,500.00	385	226 40	87,164.00	1,664.00
Management and general..	380	45 80	17,404.00	385	45 90	17,671 50	267 50
Total.....	380	270 80	102,904 00	385	272 30	104,835.50	1,931 50
Net operating profit..	380	50 1075	19,040 85	385	48.2118	18,561 53	479.32*
Other income, add.....			14,560 00			14,210.60	349 40*
Other expense, deduct			15,210.00			15,060.50	149 50*
Net deductions.....			650 00			849.90	199.90
Surplus net profits.....			18,390.85			17,711 63	679 22*
Dividends			12,500 00			12,500 00	-0-
Balance to surplus.....			\$ 5,890.85			\$ 5,211.63‡	\$679 22*

† See Table 12, for causes for variations.

‡ See Table 10.

TABLE 12

VARIATIONS BETWEEN THE BUDGET AND THE ACTUAL PROFIT AND LOSS STATE-
MENT OF THE X MANUFACTURING COMPANY

Variations in Net Profits, January, 1927							
	Due to Units			Due to Prices			Total
Variations in	Units	Price	Amount	Units	Price	Amount	Amount
Sales.....	5	\$650 00	\$3,250.00	385	—0—	—0—	\$3,250.00
Cost of sales.....	5	329 0925	1,645.47	385	\$0 3957	\$152 35	1,797.82
	—	—	—	—	—	—	—
Gross profit.....	5	\$320.9075	1,604.53	385	0.3957	152 35*	1,452.18
	—	—	—	—	—	—	—
Sales expense....	5	225.00	1,125.00	385	1.40	539.00	1,664.00
Management							
expense.....	5	45.80	229 00	385	.10	38.50	267.50
	—	—	—	—	—	—	—
Total.....	5	\$270 80	\$1,354 00	385	\$1 50	\$577 50	\$1,931 50
	—	—	—	—	—	—	—
Operating profit.....			\$250.53			\$729 85*	\$ 479 32*
Net reductions.....							199.90
							—
Balance to surplus.....							†\$ 679.22*

† See Table 11.

TABLE 13

COMPARISON OF THE BUDGET AND ACTUAL COST OF GOODS SOLD OF THE X
MANUFACTURING COMPANY

Items	Cost of Goods Sold						Variations
	Budget, January, 1927			Actual, January, 1927			Increase
	Units	Price	Amount	Units	Price	Amount	Decrease*
Inventory at beginning...	170	\$328.80	\$ 55,896.00	170	\$328.80	\$ 55,896.00	-0-†
Procurement budget.....	390	324.12	126,406.80	401	324.68	130,196.68	\$3,789.88†
Depreciation.. . . .	390	5.10	1,989.00	401	5.10	2,045.10	56.10
Total....	560	329.0925	184,291.80	571	329.4882	188,137.78	3,845.98
Less: final inventory....	180	329.0925	59,236.65	186	329.4882	61,284.81	2,048.16†
Cost of goods sold.....	380	\$329.0925	\$125,055.15	385	\$329.4882	\$126,852.97	\$1,797.82

Items	Variations						Total Amount
	Due to Units			Due to Prices			
	Units	Price	Amount	Units	Price	Amount	
Procurement.....	11	\$324.12	\$3,565.32	401	\$0.56	\$224.56	\$3,789.88
Depreciation.....	11	5.10	56.10	401	-0-	-0-	56.10
Total..	11	329.0925	3,621.42	401	0.5600	224.56	3,845.98
Less: final inventory.....	6	329.0925	1,974.56	186	0.4882	73.60	2,048.16
Cost of goods sold.....	5	\$329.0925	\$1,646.86	385	\$0.3921	\$150.96	\$1,797.82

† See Table 15.

‡ See Table 13.

would be a problem of the major and minor executives, and for that reason it is explained elsewhere. For administrative and management use, however, these somewhat remote causes are of considerable importance. If the standards of performance, upon which the budget is based, are high and performance approximates the budget, the administrators and the chief executives may rest assured that the ultimate causes are not likely to be far removed from the "caused" causes.

In Table 17 a comparison is made of the cash position of the company. The cash is short of the forecast by \$5,352.59. This is largely explained by the previous tables. The accounts receivable forecast, when allowance is made for the increase in sales, was almost perfect. Other assets were only \$10 over the forecast, and other charges were \$149.50 short of the forecast. The remaining items, if the classification in each case is the same, are of little importance.

The illustration of the X Manufacturing Company is simple and only an introduction to the use to which accounting may be put for administrative and management purposes. The illustration is for a single month, but should, in a similar manner, be extended for as long a period in advance as is considered worth while.

TABLE 14

COMPARISON OF THE BUDGET AND THE ACTUAL PROCUREMENT STATEMENT OF
THE X MANUFACTURING COMPANY

Procurement Items	Increase over Budget	Budget, January, 1927			Actual, January, 1927		
		Units	Price	Amount	Units	Price	Amount
Labor Budget:							
Direct labor.....	\$1,546.42	390	\$119.44	\$46,581.60	401	\$120.02	\$ 48,128.02
Indirect labor.....	619.01	390	55.18	21,520.20	401	55.21	22,139.21
Total.....	2,165.43	390	174.62	68,101.80	401	175.23	70,267.23
Material Budget:							
Direct materials.....	628.50	390	58.23	22,709.70	401	58.20	23,338.20
Indirect materials.....	361.73	390	32.52	12,682.80	401	32.53	13,044.53
Total.....	990.23	390	90.75	35,392.50	401	90.73	36,382.73
Factory expense Budget.....	634.22	390	58.75	22,912.50	401	58.72	23,546.72
Total procurement.....	\$3,789.88	390	\$324.12	\$126,406.80	401	\$324.68	\$130,196.68

Procurement Items	Total Amount	Variations					
		Due to Units			Due to Prices		
		Units	Price	Amount	Units	Price	Amount
Labor Budget:							
Direct labor.....	\$1,546.42	11	\$119.44	\$1,313.84	401	\$0.58	\$232.58
Indirect labor.....	619.01	11	55.18	606.98	401	03	12.03
Total.....	2,165.43	11	174.62	1,920.82	401	0.61	244.61
Material Budget:							
Direct materials.....	628.50	11	58.23	640.53	401	0.03*	12.03*
Indirect materials.....	361.73	11	32.52	357.72	401	0.01	4.01
Total.....	990.23	11	90.75	998.25	401	0.02*	8.02*
Factory expense.....	634.22	11	58.75	646.25	401	0.03*	12.03*
Total... ..	\$3,789.88	11	\$324.12	\$3,565.32	401	\$0.56	\$224.56

Sources of Information.—The chief executive has many sources from which information may be drawn, from the inside and from the outside of the business. The various executives, staff assistants, and employees are continually being drawn upon for information, and for that reason much of the information which the chief executive secures from accounting will be considered in the remaining chapters of this work. Of course the chief executive, in performing his true function, will not consider very many of the details of the accounting data. He should, however, understand its general nature.

Rating Executives.—In fairness to the major and the minor executives the chief executive should have a definite rating scale for the major executives and require them to rate their executives, and these

TABLE 15
COMPARISON OF THE BUDGET AND ACTUAL INVENTORY OF THE X
MANUFACTURING COMPANY

Items	Increase over Budget	January, 1927			January, 1927		
		Budget			Actual		
		Units	Price	Amount	Units	Price	Amount
Inventory Budget:							
At beginning:							
Finished.....		59	\$328.80	\$19,399.20			
In process.....		111	328 80	36,406.80			
Total.....	-0-	170	\$328 80	\$55,806.00	170	\$328.80	\$55,806.00
At end:							
Finished.....	\$1,598.13	75	\$329.0925	\$24,761.94	80		\$26,350.07
In process.....	451 03	105	329.0925	34,474.71	106		34,925.74
Total.....	\$2,048.16	180	\$329.0925	\$59,236.65	186	\$329.4882	\$61,284.81
Increase in finished and in process inventory.....	\$2,048.16	10		\$ 3,340.65	16		\$ 5,388.81
Raw materials:							
Beginning..	-0-			\$13,434.00			\$13,434.00
End.....	\$1,554.00			15,206.00			16,850.00
Increase.....	\$1,554.00			\$ 1,862.00			\$ 3,416.00
Total inventory:							
Beginning.....	-0-			69,330.00			69,330.00
End.....	3,602.16			74,532.65			78,134.81
Total increase.....	\$3,602.16			\$ 5,202.65			\$ 8,804.81

TABLE 16
ANALYSIS OF CAUSES FOR VARIATION IN INVENTORY

	Inventory						
	Due to Units			Due to Prices			Total
Variations in	Units	Price	Amount	Units	Price	Amount	Amount
Inventory at end:							
Finished.....	5	\$329.0925	\$1,645.46	80	\$0.3957	\$31.65	\$1,677.11
In process.....	1	329.0925	329.10	106	0.3957	41.95	371.05
Total.....	6	\$329.0925	\$1,974.56	186	\$0.3957	\$73.60	\$2,048.16†
Raw materials.....			1,544.00				1,554.00
Total variations..			\$3,528.56			\$73.60	\$3,602.16

† See Table 13.

executives in turn rate theirs, and so on throughout the organization. Among the various data, that the individual chief executive may think necessary to consider in rating major executives, should be found an evaluation of each major executive's ability to measure up to properly

TABLE 17

COMPARISON OF THE BUDGET AND ACTUAL CASH STATEMENT OF THE X
MANUFACTURING COMPANY

RECEIPTS

<i>Items</i>	<i>Budget</i>	<i>Amount</i>	<i>Actual</i>	<i>Amount</i>	<i>Increase Decrease*</i>
Cash		\$ 12,420.00		\$ 12,420.00	-0-
Expected to collect:					
Accounts receivable.	\$120,250.00		\$120,250.00		-0-
Sales	247,000 00		250,250.00		\$3,250.00
Other income.	14,560 00		14,210 60		349 40*
Total	\$381,810 00		\$384,710.60		\$2,900 60
Less:					
Accounts receivable.	103,850 00		\$104,790.01		940 01*
Bad debts.	1,250 00		1,250.00		-0-
Other assets.	860 00		870.00		10 00*
Total	\$105,960 00	\$275,850 00	\$106,910.01	\$277,800.59	\$ 950.01*
Total		\$288,270 00		\$290,220 59	\$1,950 59*

DISBURSEMENTS

Procurement Budget.	\$126,406.80		\$130,196 68		\$3,789.88
Selling expense.	85,500 00		87,164 00		1,664.00
Management and general expense.	17,404.00		17,671 50		267.50
Other charges.	13,960 00		13,810.50		149.50*
Increase in raw materials.	1,862.00		3,416 00		1,554.00
Deferred charges.	340.00		455 00		115 00
Total	\$245,472.80		\$252,713.68		\$7,240 88
Less:					
Accounts payable.	1,050.00		1,075 50		25.50*
Accrued expense.	130.00		131 60		1 60*
Overabsorbed burden.	180.00		90.60		89.40
Depreciation.	421.00		421.00		-0-
Total	\$ 1,781.00	\$243,691.80	\$ 1,718.70	\$250,994.98	\$ 62.30
Dividends.		12,500.00		12,500.00	
Cash balance, Feb. 1, 1927.		32,078.20		26,725.61	\$5,352.59*
Total		\$288,270.00		\$290,220 59	\$1,950.59

drawn budgets. If it is possible for the chief executive to relate his business to that of some reliable business curve, he will have a reliable check upon his budgets. In such a case he may place a great deal of confidence in his budget as a basis for judging his major executives. When his budgets are in the nature of "rough" estimates he cannot place much confidence in them as a reasonable basis for judging efficiency, but he may greatly benefit by knowing the various factors involved in the reasons why the predetermined results were not secured. Other data on rating executives will be found in the following chapters.

CHAPTER VII

ACCOUNTING AS AN AID TO THE MANAGER OF STANDARDS AND RECORDS

The Manager of Standards and Records.—The manager of standards and records is known by another name—that of controller. The controller is a right-hand man of the chief executive and the administrators, as well as of the managers. The chief executive is largely dependent upon the controller, and upon the organization which the controller heads, for most of the information which a wise executive requires in forming business judgment. The controller is in charge of the “information” function of a business. In his files, or the general files, should be found all the information that an intelligent organization personnel requires to run a business in an orderly manner.

The word “controller” has been used to carry the meaning of “one who controls.” He is a very different person from the individual who is no more than a head bookkeeper. The controller, if he functions properly, is one of the most valuable men in the organization.

Functions of the Controller.—In business usage few words that refer to internal organization have a generally accepted meaning. For that reason it is often necessary to use common words in a technical sense. The word “function,” for example, is often thought of as something very definite, but two businesses may be organized along functional lines and have but little resemblance in the work done. It is always necessary to arrange the work of the various functions so that the personnel of the organization can perform the tasks. This grouping of functions is usually a practical matter. For best results, the organization should take place upon definite lines. Functions should be grouped so that duplicated effort, confusion, and errors will be at a minimum.

Organization in this country, to some extent, seems to have followed along the lines of governmental organization; namely, the principle of checks and balances. Closely related functions have been set off one against the other, with the result that a sort of bureaucracy has been built up. This form of organization does not permit of the most

economical management. In one business, for example, the bookkeeping, the statistical, the finance departments and the auditing departments may be separate. The chief executive gets several kinds of information in which there is no reliability as to its coordination and comparability. Duplicated effort is found in every department. For example, the sales department keeps a record of sales, the finance department keeps a record of accounts receivable and accounts payable, the statistical department secures much information which might easily be found in the records of other departments, and the auditing department contents itself with the situation by making an audit of the books in the bookkeeping department, which are the equivalent of the records of other departments. To cite all of the duplicated effort would merely add to the paradox of the situation.

In order to secure, in the most economical manner, the information necessary for the conduct of a business enterprise, it is essential that all the functions which relate to standards and records, and the ways and means of making this information available for use, should be under the direction of one whom we may designate as the controller. The truth of this statement may be verified by the experience of some of the well-managed concerns in this and other countries. It may be stated as a fundamental principle of good organization.

A comparative study of the various functions performed by over twenty-five men who hold the title of controller or comptroller, reveals that their duties were "seized," so to speak. Most of these concerns are well known. Organization did not proceed along rational and logical lines, but each controller had broadened the scope of his activities from time to time, until he exercised most of the functions of what we conceive to be the functions of the controller. In practice, some controllers seem to desire to extend the scope of their activities as far as possible, even to assuming several of the functions of the chief executive. For this reason, an exposition of the duties of some prominent controllers would prove confusing. The functions of a controller and the duties which the man has who has the title of controller are very different. For illustration, a certain man has the title of controller. Originally he was a production man and an expert in the design and production of certain products. The chief executive and the procurement manager still value his services very highly as a production and design expert, and he devotes a considerable amount of his time to these fields. These duties, however, do not have anything to do with the functions of a controller.

What, then, are the functions of a controller? The answer to this question is largely a matter of concept. Mr. Guernsey¹ says that the duties of the controller are as follows:

1. Protection of assets, in the interest of the stockholders or owners of the business, and, in the case of a corporation, the board's source of uncolored, emotionless information.
2. Operation of the controller's group of departments including accounting, statistical, auditing, credit, and accounts receivable, accounts payable, research and financial. He must have charge of these departments in order to make sure that the information on which he relies for his facts is absolutely accurate.
3. Devising and safeguarding of all accounting and other systems used in the entire organization, including cost accounting systems.
4. Statistical portrayal of the facts; analysis, comparison, and forecasting of trends.
5. Interpretation of the facts to others in the organization, including the managers of all operating departments.
6. Seeing to it that the organization conforms to local, state, and federal laws, including tax laws.
7. Research within and outside of business.
8. Budgeting of sales, stocks, expenses, and finances.

Mr. McKinsey says that the controller "should have jurisdiction over accounting, budgeting, statistics, methods and standards, and organization."² The concepts of some prominent controllers are those that may be secured from a combination of the above-mentioned functions and duties.³ The specific duties of a controller are usually much affected by the size and the type of organization which he serves. This would not be true if we used the word "function" instead of the word "duty," as these words are above defined.

In Chapter IV the functions of accounting were set forth as those of providing (1) the standards and the records function, and (2) the ways and means of making the standards and the records function

¹ John B. Guernsey, Controller, the Emporium, San Francisco, in *Management and Administration*, August, 1923, p. 198.

² J. O. McKinsey, *Journal of Accountancy*, April, 1925.

³ Interviews with: C. A. Hess of American Telephone & Telegraph Company; W. O. Cutter of the U. S. Rubber Co.; Ernest Katz of R. H. Macy & Co.; C. W. Finney, Worthington Pump & Machinery Corp.; and Mr. H. Butt of the Tide Water Oil Company, *et al.*

serve its purposes. If the controller is one who "controls" certain activities of a concern, his functions must extend in every direction to such an extent that his authority will be coterminous with his responsibility. The specific major functions over which the controller should have jurisdiction are: the accounting function proper, organization problems and methods, office management, research within and without the concern, and ways and means of making these functions effective. Of course, the controller usually will not be able to perform much of the actual work over which he has jurisdiction. The controller is the coordinator of the information of the concern. The chief executive is the coordinator of its activities. The controller will re-

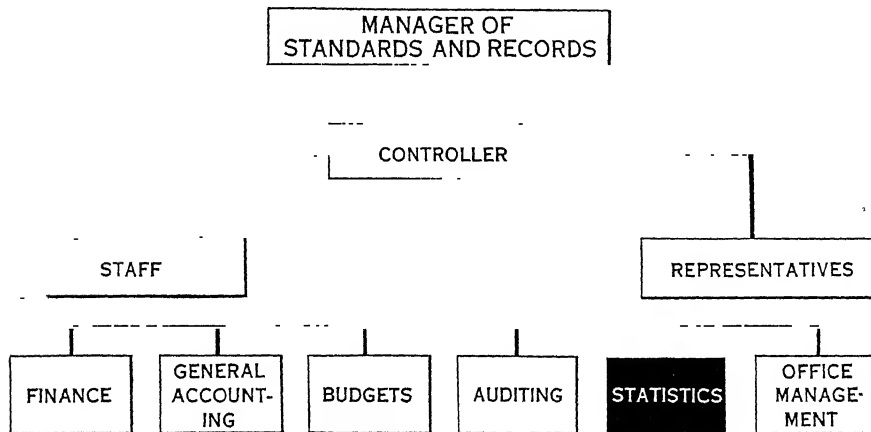


Figure 14. Organization of the Controller's Department.

quire the services of several specialists whom he will place in charge of certain of his functions.

Organization of the Controller's Department.—The functional organization chart of a controller's department is shown in Figure 14. It will be observed that the controller is called the manager of standards and records, and that we defined accounting as consisting partly of standards and records. Accounting, in a broad sense, is interested in all the different phases of the controller's work. The functions of the controller are not, however, the same as the functions of accounting. It is not the function of accounting, for example, to provide ways and means for the office manager to accomplish his task, but the accounting function cannot be carried on properly unless the office manager does his job in an acceptable manner. There is a close interdependence between all of the functions of the controller and the functions of accounting. It is for this reason that we need a man-

ager in charge of all the functions that are closely related to the standards and the records. This same principle of organization should be followed in grouping all of the functions of a business.

The cross-currents of authority and of responsibility in an organization are strong even in the best type of organization. If a conscious effort is not made to keep these cross-currents at a minimum, the business must suffer because of the lack of unanimity of purpose throughout the concern. The economy that comes from the specialization of jobs may be negative if the work is not properly related and bound together. This is where a manager is needed.

The functions of the controller may be classified into two main groups: the direct functions and the indirect functions. In the organization of the controller's department, due consideration must be given to the geographic location of the various activities of the concern. If the operations are such that the standards and the records function may be administered satisfactorily under the direct supervision of the controller, the line of control may be said to be direct, and the function a direct function. Where the operations are scattered so that many of the functions of the standards and the records must be performed under the supervision of officials other than the controller, the functions would be indirect.

In performing the standards and records function in a concern that has branches, the controller will prescribe the ways and the means for the accounting work to be done. The representatives who carry on the work will be under the supervision of a branch manager, who is a functional representative of the controller. To illustrate, one controller has representatives in many parts of the world who perform the accounting work necessary for the operation of the local business.

The Staff.—The controller has either direct or indirect functional control over staff men or technicians. It will be observed that the controller has either direct or indirect control of all staff men. This may appear to some readers as a novel idea. It has been the experience of several large concerns that this is the best way to handle the staff question. Such a procedure, in a large organization, keeps a check on research, the value of the probable outcome of which is open to question. It also gives the controller and the chief executive a good opportunity to find out what "should be."

One case is known where the controller found that a number of technicians had spent years of time at good salaries and had consumed a considerable amount of supplies, in investigating matters which

were of negligible importance to the concern under any practical conditions. The objects of the research must offer a reasonable opportunity to make profits for the concern or to render it services. If it does not do this, the research is of not enough practical importance to justify the necessary expenditure of money to secure the results. Facts and the most economical ways and means of doing certain things sometimes cost much more than the possible results could warrant. On the other hand, there are many facts and many ways and means of doing things, and many business enterprises could afford to spend considerable sums in finding out these things. The man who is capable of being a controller should be the best man in the organization to find the facts about the practical value of the line of research contemplated.

Of course the controller will not direct the actual research, other than in his own field, but in performing the functions of the controller he must play a prominent part in establishing the facts upon which standards are based. For illustration, suppose that the manager of the marketing function is convinced that the concern should put on an advertising campaign. The chief executive wishes facts upon the matter before deciding to spend a considerable sum in national advertising. The research into such a problem involves an investigation into the standards and records of the concern, both prospective and actual. The controller may have in his files, or he may be able to secure from the files of other concerns, sufficient scientific facts upon which the question may be decided. The research into such a problem may have to be carried on largely by professional technicians, but in performing the control function the controller should be the best man in the organization to interpret the practical significance of the findings.

In a large organization the staff may be headed by a technician specialist. This specialist may supervise the research work, but the lines of research should be evaluated by the controller and approved by the chief executive. The chief executive may direct that a certain line of research be carried on under the direction of some major or minor executive whom he thinks could do the work creditably, but the controller's function should not be lost sight of in the cross-currents of his tasks. For example, research into certain fabrication processes may be carried on under the personal supervision of a plant manager, but before the research takes place the controller must present the necessary evaluated facts to the chief executive for his approval. The controller may draw his facts and his estimates from within or from

without the concern. He will usually evaluate the estimated results which others predict to see if the proposition possesses practical significance, but it is the function of the executives to pass upon the evaluated significance of research, and authorize research in the particular functions over which they have authority.

The work that may be performed by the staff men in one business concern may be performed by the regular organization in another concern. The statistician, for example, in one concern may be considered as a staff man under the supervision of the chief executive. In another concern, he may be in charge of a regular department under the supervision of the controller. If the principles of organization previously laid down be accepted, it is clear that the statistician performs a function of the controller. There seems to be no clear-cut way of distinguishing a staff function from its major function, unless the lines for such a distinction be drawn along that of the authority and the responsibility which is necessary for the accomplishment of a given end. The controller, for example, performs several staff functions but he is more than a staff man; he is a peculiar kind of an executive. He is the manager of the standards and the records of a business enterprise.

The Office Manager.—It has been said that the duties of the office manager are what he makes them. From the viewpoint of sound organization principles, the functions of the office manager cannot be the same as his duties, if he assumes duties beyond the function of the office manager. The broad functions of the controller should be analyzed into certain major functions, if the best results are to be secured. In Figure 14 the functions of the controller are divided along six main lines. There are several important functions of the controller that may be assigned to the office manager. Some of these functions are given below:

1. the general layout of the offices and the flow of work,
2. the design and care of office equipment,
3. the handling of the office mail,
4. the handling of the communication ways and means, such as telephones, messenger boys, intercommunication systems, etc.,
5. the maintenance of proper filing services,
6. the standardization, measurement, and control of stenographic and other clerical work.

7. the selection of certain of the office employees, and
8. the advisory function.

The office manager may perform other duties that may be related to but not a function of the office which he controls. Thus, he may assist in the teaching and the training of employees, which is a function of the manager of personnel. In a sizable office, the office manager will have a considerable amount of executive work to do in getting his functions performed properly.

The functions which may be assigned to a particular office manager will depend upon the conditions of the particular case. Where practicable, however, the office manager should not be assigned direct functions which tend to interfere with the work of other functions. If a direct function of the office manager cannot be performed by him, it may be handled indirectly. Care should be taken, however, to see that the proper cooperation is secured, or the cross-currents of responsibility and of authority will result in a decreased effectiveness in operation.

Some Relations of Accounting to Office Management.—The standards and the records functions extend throughout the concern. Standards and records plus ways and means of making standards and records effective is accounting. Accounting is a science, but its application to a business problem is an art. A similar statement may be made regarding office management. The science of office management has to do with getting work done while the science of accounting has to do with the principles to be followed in stating facts and forecasts. The art of accounting makes use of the principles of accounting in stating facts and forecasts, while the art of office management has to do with the application of the principles of getting work done to the actual work. The concepts of the functions of accounting and of office management are quite distinct. The application of the principles underlying each concept to specific problems gives rise to cross-currents of authority and of responsibility. This tends to befog and make less apparent some of the differences in functions than is really the case.

The persons in charge of the various accounting functions cannot perform their own functions in an economical manner unless they apply properly the science of office management to the accomplishment of their functions. This gives rise to a number of management problems. Will the office manager supervise the methods of doing

work in the various departments? Will he rate all of the office employees? Will he select the office employees for the various departments? Will he keep the office employees' records? Will he schedule the office work? These are but a few of the questions that arise in practice. There are no logical answers to these questions unless the various duties be analyzed along functional lines. Even then, the grouping of the functions must be in such a manner that the cross-currents in the organization will be at a minimum. If this is not done the results will be that much preventable waste will likely take place.

The close interdependence of accounting and office management has doubtless caused some writers on office management to place the office manager in a more strategic position than his functions seem to warrant. The various accounting functions in a sizable concern require a considerable personnel to make the standards and the records function effectively. The persons in charge of the various phases of accounting would like to have all the work, which they consider necessary for the performance of their functions, done in their own departments. The office manager would like to have all the work done under his supervision. This practical difficulty met in organization work is an important reason for having a controller.

The various functions performed by the standards and the records and their closely interrelated functions must be kept in proper perspective, one toward the other. The information must be homogeneous, reliable, and capable of being made effective in use. It is very unlikely that these aims could be secured except through a centralized official.

The Auditor.—The audit function in a business is an important function of the controller. Some writers think that the auditor should report to: the president, the board of directors, or, better still, to the stockholders. The idea is to give a check on the various officials. The important thing, however, is to have effective control, and this is too often obscured by a system of checks and balances. The functions of accounting not only provide for making the records but also provide for a check upon the accuracy of these records and the facts back of the records.

Two types of audits may be distinguished: private audits and audits by public accountants. The audits of the public accountant have been recognized for reasons mentioned in Chapter II. The limitations of the scope of public accountants' work by the client or the nature of the work undertaken, and the relatively high charges made for work done, etc., make it advisable for a sizable concern to have its

own auditors. The object and scope of public and private audits are not of the same nature.

The private auditor performs the function of verification of the accuracy of facts and statements of facts. The employees under the direction of the auditor may verify every transaction of the concern; every asset, every liability, and every net worth item. This is called a detailed audit.¹ The usual procedure seems to be to make a detailed examination of certain portions of the work, as the expense of a detailed verification is considerable. The system of internal check makes it highly improbable that any significant facts will remain long uncorrected.

In a well-organized controller's department, the auditor may well confine his activities to statements of fact. Forecasts are made by specialists in budgetary procedure. This function is quite different in nature from fact verification. Balance sheets and statements of earnings are often matters which give rise to the need of expert opinion. Whether they represent the actual status as of a particular date in the past any better than properly drawn budgets of anticipated operations is often questionable. Since the auditor lives mainly in the past and the specialist in budgeting lives mainly in the future, it is easy to draw a line of demarcation between the functions of each specialty.

The Controller's Tools.—The controller has many instruments to assist him in the performance of his functions. His instruments consist of instruments of internal control. The chief executive views the controller as one who sits near the throttle of the business as an outlook for the pilot. The controller is a technician who operates the mechanisms for determining the direction, the rate of speed, the resistances, and the results accomplished in a business enterprise. He should provide the ways and means for the business experiences to be so recorded and visualized that the chief executive, the administrators, and the managers may know how to operate the business machine at a maximum of efficiency.

The main tools which the controller has to assist in the performance of his tasks are as follows: (1) the budget; (2) general accounting; (3) financial accounting; (4) statistics; (5) verification or audit; (6) reports of many kinds. Some of these instruments are discussed in the present chapter, while others are discussed in subsequent chapters.

Organization of the General Accounting Department.—The functional chart of the general accounting department of a fair-sized

¹ See Montgomery, R. H., *Auditing, Theory, and Practice*.

concern may be represented by Figure 15. The chief accountant is in charge of the department, which consists of eight sections, as follows: (1) general ledger section; (2) cost accounting section; (3) accounts receivable section; (4) accounts payable section; (5) pay roll section; (6) billing and computation section; (7) tabulating section; (8) reconciliation section. Some of the functions of each of these sections are given below.

The general ledger section has as its main function the keeping of the general ledger of the concern. In the general ledger should be kept, in such form as the controller may direct, the postings from the

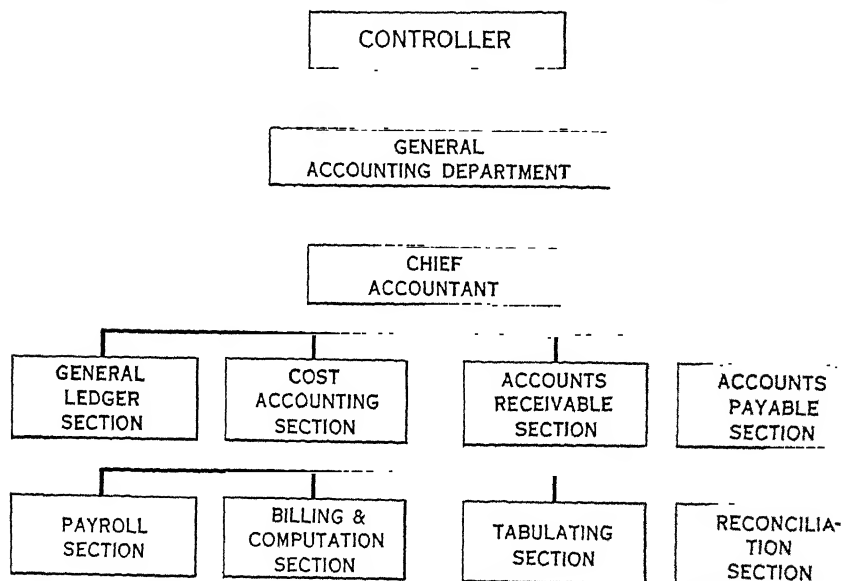


Figure 15. Organization of the General Accounting Department.

records of original entry or from records prepared therefrom. The entries in the general ledger usually become too intricate to have budget entries made in it. The better plan is to make the necessary analyses and comparisons between the budget and the actual figures by the use of work-papers.

The cost accounting section has for its function the determination of costs. Because of the importance attached to cost information as an administrative and management tool, the subject is discussed in Chapters IX, X, and XI.

The accounts receivable of many concerns are so numerous that it is necessary to have a department in which this work may be performed. The accuracy of the totals may be proved by what is known

as a control account. This is an account kept in the general ledger in which is entered the total of the debits and the credits for a particular day or month. This provides a check on the accuracy of the total accounts but not on the accuracy of individual accounts receivable. The work of this section may be subdivided as far as conditions require, and the accounts may be classified as follows: customers, territory, salesmen, merchandise sold, or otherwise.

In many lines of business it is quite essential that the accounts be kept very accurately and the status of each account determined every business day. Unless the accounts receivable data are stated in accordance with good accounting practice, the use to which the information can be put for management purposes may be greatly decreased. The relationship between accounts receivable and some other accounting data is presented at a later stage of development.

The accounts payable section has a somewhat similar function to that of the accounts receivable section. The only difference is that the accounts receivable section records information as to assets while the accounts payable section records information regarding liabilities. The liabilities listed under accounts payable should be classified according to the purpose for which the liability was created.

The pay-roll section performs the important function of recording information relative to salaries and wages. The work done in this section may relate solely to the keeping of the pay-roll account and may leave to the cost department the other accounting functions relative to pay rolls. A function of the manager of finance is to make the pay-roll payments.

The billing and computation section has the functions of preparing all statements of purchases, sales, etc., and the necessary computations. This work may be done in other departments, but it will usually be done more economically if performed by the accounting department. The accounting department will be judged by many people who have no other contacts with the department except through the billing and computation section. For this reason the work should be accurate and in good form.

The reconciliation section has as its main function the reconciliation of and the determination of the causes for variation between the forecasts and the achievements. The "causes" for variation should be determined, and where the variations are significant an appraisal should be made of the "exact causes" for variation. This work may

best be accomplished by representatives of the budgeting and the general accounting department.

The personnel of the accounting department is limited by the nature and the extent of the work to be accomplished. The work can be so planned, however, that the principles of the specialization of labor can be carried as far as the individual case permits it to be carried.

Accounting as an Aid to the Controller.—The controller can perform but a small part of the total work performed by his department. His work in the department should be that of indicating how the information should be gathered, and in interpreting the significant data. This means that the controller will have supervision of many functions, but this will be largely advisory in a large organization. Each department head should interpret the data which he prepares for the use of the controller, but the interpretation which each department head places upon the data is not likely to be the same interpretation that the controller places upon the data. The interpretation which the department heads place upon their data will usually be too technical for operating executives. The controller should take the data that are gathered by the various departments and interpret these data in such a manner that the data will carry a message to those not familiar with accounting technique.

Accounting forms the ground work or foundation upon which the controller builds his structure. The facts which the various accounting data provide, from the management standpoint, are relative and require interpretation before they provide significant information. Suppose that the chief executive is informed that the cash balance as of a particular date is \$265,846.32. Whether or not the information is significant to the chief executive depends upon his knowledge of the cash requirements of the business. He might interpret the fact to mean that there is ample cash in the bank, when as a matter of fact the treasurer must seek loans in the immediate future. The same principle may be applicable to all the information which the accounting department renders. With a controller, at the head of the standards and the records function, who can interpret accounting data in the light of proper standards for the business, the executives have information upon which they can rely for the conduct of the business.

The Relation of the Controller to Standards.—One of the most important functions of the controller has to do with his relations to business standards. For convenience in discussion, standards may be divided broadly into two classes, but there is a very close interrelation

of one to the other. This division may be made along the lines of (1) financial standards and (2) operating standards. The former has to do largely with items that reflect upon the financial status or the budget balance sheet of a business, while the latter deals largely with the items that may enter the budget profit and loss statement.

The controller serves in two distinct capacities in performing the standards function. In one case he should act in an advisory capacity, while in the other case he should act in the capacity of one having received executive authority from the chief executive. This general concept may be illustrated by two examples. Suppose that the question is raised as to the specific kinds and proportions of products to be manufactured for sale. The ascertainment of many of the facts should be left to the controller and his counsel may help materially in deciding the matter, but the question is one that should be left to the marketing and the procurement managers to decide, or to the chief executive, in case they cannot agree. In case the finance question is important, the controller should help to decide the matter. In a case where financial standards, as such, are involved, the controller should be responsible for the interpretation of the policies of the board of directors. In a great many cases operating standards will affect financial standards so that the controller may well assume the supervision of the budget function.

Further consideration of financial standards will be found in the following chapter and the chapters related thereto. Operating standards will be considered further under "reports" in this chapter and at other interrelated points.

The Relation of the Controller to Records.—As has been indicated previously, there are many kinds of records. The types of records in which the controller is interested relate to the ways and means by which financial and operating results are to be recorded. The controller should devise the records and issue instructions for the proper keeping of these records. Through the auditor's office the controller ascertains whether or not the records are kept properly and in accordance with instructions.

Mr. A. R. Erskine, President of the Studebaker Corporation, says :

The responsibility rests on the comptroller . . . of every corporation for the character of its accounting system, for there lies the secret of success. . . .

Big business generally is equipped with efficient accounting systems which comprise, briefly, (1) original records, (2) operating reports, and (3) financial reports for the information of stockholders, directors, and managers. . . .

Unless managers thoroughly understand them, however, and use them to correct wrong conditions and take further advantage of opportunities they disclose, their value is diminished. Managers must possess at least a good working knowledge of accounting. . . . Every member of management from the foreman up to the president must be an analyzer of reports and a seeker of improvements.¹

The controller has direct or line authority for the control of the keeping of many of the records which he requests to be kept, or through which he requests information. For example, the salesman uses a record blank to record sales and the factory worker records time and material on blanks for information. The control here is indirect or functional, but the manipulation of the data would be direct control.

Blanks may be used to serve as convenient tools for the control of business orders. When blank forms are designed properly and wisely used, they facilitate the transmission of orders required for action in business. They may provide the original records of business transactions. These original orders may be analyzed and classified in such a manner as the controller may designate. This phase of the work is a function of the general accounting department.

Through the operation of the records function the controller secures certain facts about the financial and operating results of the business. These results, if analyzed in the same manner that the standards are analyzed, provide a record of achievement that may be compared with the standards. An analysis of the standards and records will disclose causes for variation between the two. This information may be used effectively by the controller in helping to place responsibility for the success or for the failure of the concern to achieve the results, which, under the business conditions faced, should have been attained.

It is not the object of this treatise to discuss the technique of book-keeping, or the design of accounting systems that conform to the rules of good accounting practice. In discussing the larger phases of accounting, these phases of the work of accounting have been taken for granted. They may be secured from accepted works on the subject.

Administrative and Management Reports.—The standards and the records functions cannot serve their prime aims unless the information which they contain is made available for those who require

¹ *Manufacturers News*, May 3, 1924.

it as a basis for action. Reports are the means by which the information that is contained in the standards and records is made available for administrative and management uses. The exact kinds and the nature of the reports that should be prepared will depend upon the individual case.

Some of the questions that should be answered before deciding upon the kind of reports that should be rendered are as follows:

1. Is the report needed in the conduct of the business?
2. Who needs the report?
3. Can the report be used by those who should receive it?
4. Will the report be used by those for whom it is prepared?
5. Can the report give information that is evaluated and interpreted in the report itself?
6. Can the pertinent facts be presented on a single sheet of paper?
7. Can the fundamental facts be related to other data and made comparable or contrasted readily?
8. How long will a particular report be needed and used by those who receive it?
9. When should the report be prepared and at what periodic intervals?
10. What will be the probable cost of preparing the report?
Does the probable benefit exceed the cost?

The controller may well demand a satisfactory answer to each of these questions of every report which he makes or approves. Information that is contained in reports should "stay sold"; but the moment he finds that the information is no longer effective, the controller should, if practicable, make the information effective or discontinue the report.

Reports, like standards and records, may be classified into two main varieties. These two classes of reports, together with some of their subdivisions, are listed below:

I. Financial Reports.

Balance Sheet Reports.

- (1) Cash Requirements Report.
- (2) Accounts Receivable Report.
- (3) Inventory Requirements Report.
- (4) Equipment Requirement Report.
- (5) Accounts Payable Report.

II. Operating Reports.

Profit and Loss Reports.

(1) Marketing Reports.

(a) Sales Reports.

(b) Publicity Reports.

(2) Procurement Reports.

(a) Production Reports.

(b) Purchases Reports.

(3) Labor Reports.

(a) Employment Reports.

(b) Training Reports.

(4) Management Reports.

(a) Expense Reports of various kinds.

(b) etc.

These reports may be either forecasts or statements of achievement. They should conform to the standards which the controller sets for particular reports, or to the requisites of a first-rate report.

Operating Reports.—As indicated above, operating reports may cover a variety of subjects relating to operations. A basic reason for engaging in business is to make profits, and these may be conveniently shown in the profit and loss statement. The profit and loss statement is a report of the operations of the business for a stated period of time. It tells, in its own way, a story of the business. Its story is usually in terms of the effects which operations have produced upon the finances of the business. For example, the profit and loss statement may show the “effects” of the sales, the cost of goods sold, the selling expenses, the general expenses, and the resulting profits. It may show little or no insight into the “causes” of these various items. The business man needs not only to know the “effects” of transactions upon the business, but he needs to know the “causes” which give rise to the effects. From the point of view of administrative and management control, the causes back of the effects which are produced are of much more importance than the effects themselves. Control comes largely from knowing the causes for the effects which are produced.

In studying the effects, without studying the causes for the effects, it is easy to draw erroneous conclusions. This may be illustrated by reference to a certain great discovery. Before people had a definite idea of what germs were, Pasteur began to experiment to

find out the causes for spoilage of meat, milk, butter, etc. Every intelligent person of his day was familiar with the fact, for example, that milk would sour. They knew the effects, but of what value was that for purposes of the control of spoilage? It was of but a limited value. The discovery that germs are the cause for decay was a great discovery indeed, because a knowledge of causes of germ action led to the finding of ways and means for the control of certain germs. It may be observed that the scientist is seldom, if ever, concerned with "ultimate" causes, in the sense of concerning himself with such questions as, for example, the following: what is the original cause of germs, and where did they come from? In science, causes are ascertained by finding the effects produced under given conditions.

It does not seem prudent to expect general profit and loss statements in terms of results to prove effective for purposes of administrative and management control. Such statements, however, are often used for that purpose. There are a great many forces working together that give the results expressed in the profit and loss statement. It is somewhat like getting management data from a target practice. Suppose that a hundred rifle men shoot for one hour at targets, and a record be made of the score of each man. From each individual score a record could be compiled which would show the net effectiveness of the total shots. Suppose, however, that it is revealed that each man fired under a variety of conditions. How will the results be interpreted for management use? If the same procedure were followed, a thousand experiments would prove of little use for management purposes.

How, then, may operating data be used for purposes of management control? The general principles to be followed, as expressed previously, are: (1) determine standards for performance; (2) express the results in terms of the standards; (3) ascertain the causes for variation. These principles may be better emphasized by an illustration.

Budget vs. Actual Profit and Loss Reports.—In Table 18 is given the budget as compared with the actual profit and loss statement. The budget is built upon a number of major budgets. If these major budgets are built up properly, they may serve as a standard by which performance is to be judged. Actual performance will usually vary from the budget. Because of this variation, it is necessary to study the causes which lead to the variations in order to profit most from the experience. The sales budget, Table 18, for example, was

TABLE 18

THE PROFIT AND LOSS STATEMENT COMPARED WITH STANDARD PERFORMANCE
OF THE X MANUFACTURING COMPANY.

Items	Prediction		First Quarter, 1927			Actual		In-crease
	%	%	Budget Price	Amount	%	Price	Amount	
Sales	+ .71	100 0000	\$5.25	\$202,125	100.0000	\$5.26	\$203,562	\$1,437
Cost of sales.....	+ .94	0.4552	2 39	92,015	0.4563	2.40	92,880	865
Gross profit.....	+ .52	0 5448	2 86	110,110	0.5437	2.86	110,682	572
Sales expense.....	+ 1.28	0.2476	1.30	50,050	0.2490	1 31	50,697	647
Management expense..	- 1.13	0.1162	.61	23,485	0.1141	.60	23,220	265*
General expense.....	- 3.35	0 0495	.26	10,010	0.0476	.25	9,675	335*
Total.....	+ 0.006	0.4133	2.17	83,545	0.4107	2.16	83,592	47
Net operating income...	+ 1.98	0 1315	\$0.69	\$ 26,565	0.1330	\$0.70	\$ 27,090	\$525
Add:								
Other income.....				8,650			8,730	80
Deduct:								
Other expenses.....				6,500			6,620	120
Net additional income.....				2,150			2,110	40*
Total net income.....				\$ 28,715			\$ 29,200	\$ 485
Units.....			38,500			38,700		

* Decrease

Variations in	Due to Units			Due to Prices			Total Amount
	Units	Price	Amount	Units	Price	Amount	
Sales.....	200	\$5.25	\$1,050	38,700	+\$0.01	\$387.00	\$1,437
Cost of sales.....	200	2.39	478	38,700	+ 0.01	387.00	865
Gross profit.....	200	2.86	572	38,700	-0-	-0-	572
Sales expense.....	200	1.30	260	38,700	+ 0.01	+ 387.00	647
Management expense.	200	.61	122	38,700	- 0.01	- 387.00	- 265
General expense.....	200	.26	52	38,700	- 0.01	- 387.00	- 335
Total.....	200	2.17	434	38,700	- 0 01	- 387.00	47
Net operating profit..	200	\$0.69	\$ 138	38,700	\$0.01	\$387.00	\$ 525

less than the actual performance, by .71 of 1 per cent, or an amount in excess of the budget of \$1437. A study of the variations between the budget and the actual performance shows that, on the face of the statement, the variations due to unit fluctuations was \$1050, and the variations due to price fluctuations was \$387. There may be many causes for variation between the budget and the actual per-

formance, and for that reason the subject of causes for variation will be further developed later.

The object here is to study some of the administrative and management information that may be secured from the general profit and loss budget in comparison with the general profit and loss statement. Such a study will be of considerable value to the chief executive and the board of directors. They are interested in the future of the business, and study its past largely to see the outsider's point of view. A number of controllers were asked what they did with the public accountant's reports. Only one out of the seventeen controllers of whom inquiry was made took time to read the reports. Nearly all of them pointed out the places where they were "kept," little or no examination of the reports having been made. A somewhat similar situation obtained when a number of chief executives were asked this same question. This is cited to show that management is interested in the future.

For purposes of control, administrators and managers need to know the future. From the management viewpoint the past is past. The conditions that obtained last year or last month are of value only as they help to get a better picture of what is likely to be obtained during the next month, the next quarter, or the next six months. For this reason, management should test continuously its marksmanship so as to be able to determine the approximate effectiveness before, instead of after, the shot is fired. A single "bad shot" has ruined many a business. In an industry where competition is effective, business success comes to those who foresee conditions best and adjust the business to those conditions.

The budget should determine the approximate effectiveness in advance. Management cannot exert any influence over that which has already taken place. Executive action can, however, often be very effective in the control of results that have not taken place. In the case of the X Manufacturing Company, Table 18, for example, the various executives have a plan of action laid out for three months in advance of operations. This plan of action is subdivided for shorter periods, so that the executives may know at relatively short intervals how plans are being carried out. The profit and loss statement as here set forth shows, in a summary way, what the results were as compared with the predetermined results. A study of "first causes" analyzes the variations into unit and price variations. Such a study will frequently give a good idea of the "effective causes" for variation. As explained before, it is not the "ultimate" causes that science generally deals with.

but with "effective" causes. A study of the underlying budgets in comparison with the achievement should reveal the effective causes for variations.

In the present case the management foretold profits within 2% of the actual profits, three months in advance. The following gives the accuracy with which other results were forecast: sales were only 71 of 1% greater than the forecast; cost of sales was .94 of 1% greater than the forecast, which resulted in gross profits of .52 of 1% greater than the forecast; and the total expenses were almost exactly foretold.

CHAPTER VIII

ACCOUNTING AS AN AID TO FINANCIAL MANAGEMENT

The Finance Function.—Since business success is usually judged by financial results, it is quite natural that the finance function in business has been given a very important place. The function of finance in a business enterprise may be grouped into two main divisions, as follows:

- (1) To provide vested assets, and
- (2) To provide additional working assets.

While these functions are closely interrelated, they are, in many respects, quite separate problems, which will be brought out later. Finance proper is generally treated from the standpoint of the permanent or semi-permanent liabilities of the business. From the management point of view, the problem is one of interrelations and the asset side of the balance sheet is looked upon as of considerable importance.

Some of the important questions dealt with in finance are: how to raise money for different classes of business; what kinds or types of securities to issue; how and to whom should they be sold; how should the proceeds be used; how shall the funds that come into the business be protected; how shall the concern be protected from insolvency; and other questions. The point of view here is that of the financier.

The Importance of Finance to Business.—The provision of assets for a new enterprise is often such an important matter that it is easy for the financier to discount greatly the other functions of the business. This is likewise true in re-financing a business. Once the finances are upon a sound basis, the management can look to matters which now assume great importance and the finance question can be set in its proper perspective.

The finances of a sizable corporate business generally depend upon something more fundamental than the investor's money. The concern must be properly administered and managed, and it must be able to perform such services as will yield a money profit to it. If

the concern does not have the potentiality and ability to earn a satisfactory profit, it does not deserve to exist as a business enterprise. If the concern expects to exist for any considerable period of time, it must demonstrate its ability to earn a profit commensurate with the risk involved in its conduct. Thus, there are always conditions precedent to the importance of capital in a particular enterprise, and there are likewise matters coordinate with finance.

It is a well-known fact that most business administrators are concerned but seldom, if ever, with the major problems of finance; namely, those of original financing and re-financing. They are dealing almost continuously with the current problems of finance. The importance of original financing and re-financing should not be underestimated, but the problem of current financing should be set in its proper perspective.

Determining Asset and Liability Requirements.—Many of the most important phases of finance cluster about the problem of determining the kind, amount, and the net worth of the concern in the assets which will be required to operate the business in accordance with its policies. The assets which a particular concern owns are largely a matter of financial policy. There are a number of factors that are involved in the actual determination of the amount of assets which are necessary to carry on a particular business. Some of these factors are as follows:

- (1) The nature and extent of the business,
- (2) The profitableness of the business,
- (3) The status and nature of competition, and prospective competition,
- (4) The policy of the concern regarding the liabilities and,
- (5) What is known as the business cycle or business conditions as they affect the particular business.

Each of these factors will be discussed briefly.

The nature and extent of a business often have considerable to do with the assets in which it will have a proprietary interest. To operate a successful bank or brokerage house, for example, the asset requirements may be twenty or thirty times the net worth of the concern in those assets. In a manufacturing business, on the other hand, the concern will usually be expected to own two-thirds to three-fourths of the assets over which the concern has control. This leads to the question of credit safety factors. There is no general rule to follow in this regard, but in the last few years a considerable amount of

interest has been manifested in such ratios, as they apply to balance sheets and operating statements. From the viewpoint of control, however, attention should be directed to keeping these ratios at their proper proportions, which may vary with business conditions.

The profitableness of the business has a direct bearing upon the asset requirements and the ratio of net worth which a concern should have in the assets necessary for the conduct of the business. The steadiness of profits usually has more to do with this question than the amount of the profits. A highly profitable business may be able to finance all of its extensions from the profits which it makes. A concern with adequate and steady earnings, as some public utilities, may have—with safety—a much less ratio of net worth than a commercial concern, for example, whose earnings are much higher but less stable. The low ratio of net worth in a business of the common stock often has much to do with its profitableness. For example, a concern with a steady income of \$300,000 per annum and a capital common stock of \$4,000,000 would be able to earn 10 per cent instead of $7\frac{1}{2}$ per cent if it could issue and sell \$2,000,000 of 5 per cent bonds and retire an equivalent amount of common stock.

The status and nature of the competition and prospective competition which a firm faces has a direct bearing upon its asset requirements and the equity which it should own in the assets. Where competition is effective, the services rendered will usually have to be extended, and this increases asset requirements with the result that the net worth of the concern will decline and may have to be increased. Profits may decline and this may require more assets and more net worth in the business. Competition among those from whom goods are purchased may cause a decrease in asset requirements and bring about a greater equity in the assets owned. Many concerns have found it necessary to extend greatly their businesses because of competition. This has a direct bearing upon the provision for asset requirements and liabilities in a business when it is organized or reorganized.

The financial policy which the policy corps forms for the business will have much to do with the equity of the concern in the assets which it owns. The results of an inadequate net worth in a business is often insolvency and bankruptcy. Where the net worth in a business is high, bank loans may be secured easily to tide the concern over current financing; but if the net worth in the business is low, it may be that the bank will not extend the accommodation requested. The reasons for having a low net worth in a business are: (1) the lack of

ability to secure a higher net worth, and (2) the profits may be increased on a low net worth. Each of these points was illustrated above.

The business cycle also affects the asset and net-worth requirements of a business. If prices of commodities are high a business may find that while its physical volume has actually declined its asset requirements in dollars have been increased considerably. This may call for more loans and a less ratio of net worth in the business or the sale of more proprietary interest in the business. Many concerns have suddenly found themselves in financial difficulties due to the rise or fall in the price of commodities. For this reason, the probable price of commodities bought and sold should be anticipated as accurately as the financial policy of a concern requires. A low net-worth policy will generally require much better financial management than where the ratio of net worth in the business is high.

Vested Assets.—The term “vested assets” is used here to denote the total assets which are required for the “normal” conduct of a business. It includes current assets as well as fixed assets. From time to time, it may be necessary for a concern to resort to short-term borrowing. Such loans furnish additional working assets. Some of the reasons for such a classification of asset requirements are given below. A distinction has been made between an asset itself and a liability or net-worth item which may be offset in the balance sheet by an asset. Capital to the business man and the accountant usually means capital stock, and not assets. For that reason a business man seldom thinks of his liabilities as being a part of his “capital.” He prefers the words “assets” or “resources” to “capital” and uses the term “capital” as indicated above.

Questions relating to vested assets lead immediately into a large phase of private finance. Some of the most important questions are as follows: (1) How much capital stock must be issued? (2) What types of securities should be issued? (3) To whom can they be sold to the best advantage? (4) On what terms can the necessary cash or assets be secured? These questions assume a certain probability of success in the conduct of a business. These are conditions precedent to the organization of an enterprise that has back of it a high ethical concept.

The question of “how much capital stock must be sold” is a question that is too often answered without an adequate knowledge of the factors involved in the question. Possibly the best way to get the necessary factors bound together in a logical manner is by the use of

TABLE 19

THE DETERMINATION OF CAPITAL REQUIREMENTS
(000 omitted)

<i>Assets</i>	<i>Budget Inception</i>	<i>Budget First Year</i>	<i>Budget Second Year</i>	<i>Budget Third Year</i>
Current assets:				
Cash	\$1,000	\$ 468	\$ 262	\$ 870
Accounts receivable.....	—0—	140	380	450
Notes receivable	—0—	60	170	210
Merchandise inventory.....	—0—	160	320	510
Sub-total.....	<u>\$1,000</u>	<u>\$828</u>	<u>\$1,132</u>	<u>\$2,040</u>
Fixed assets:				
Land.....	300	300	300	400
Building.....	625	675	675	975
Machinery and equipment.. .	1,000	1,250	1,250	1,600
Furniture and fixtures.....	95	100	100	110
Other equipment.....	60	70	70	90
Sub-total.....	<u>\$2,080</u>	<u>\$2,395</u>	<u>\$2,395</u>	<u>\$3,175</u>
Total.....	<u>\$3,080</u>	<u>\$3,223</u>	<u>\$3,527</u>	<u>\$5,215</u>
<i>Liabilities</i>				
Current liabilities:				
Accounts payable.....		\$40	\$110	\$125
Notes payable.....			100	50
Taxes		10	15	20
Pay roll.....		8	12	15
Sub-total.....		<u>\$58</u>	<u>\$237</u>	<u>\$210</u>
Fixed Liabilities:				
Ten-year note 6%.....				<u>\$1,500</u>
Sub-total.....				<u>\$1,500</u>
Net worth:				
Capital stock, common.....	\$2,080	\$2,080	\$2,080	\$2,080
Capital stock, pfd. 8 %.....	1,000	1,000	1,000	1,000
Reserves		75	160	250
Surplus.....		10	50	175
Sub-total.....	<u>\$3,080</u>	<u>\$3,165</u>	<u>\$3,290</u>	<u>\$3,505</u>
Total.....	<u>\$3,080</u>	<u>\$3,223</u>	<u>\$3,527</u>	<u>\$5,215</u>

accounting principles. Unless the asset requirements are estimated correctly, the concern may find itself in serious financial difficulties even before operations are begun. For this reason, the net worth and the cash requirements of the business should be estimated as accurately as possible and for a considerable period in advance. This may be accomplished by converting the various estimates into such terms that they may be represented in a budget balance sheet, as illustrated in Table 19. The advantage of such planning is that it makes provision not only for the requirements for fixed assets, but also for the necessary expansion. It also provides for the necessary working assets, and makes sure that the cash provided will be ample for the requirements of the business.

In this illustration, care has been taken to see that there is at all times sufficient cash to meet maturing obligations. If \$250,000 less cash had been provided by the sale of stock, the concern might have found itself in difficulties during the second year of its existence. To provide for proper expansion of the business, it would be necessary to sell more stock or secure a long-time loan during the third year. With cash requirements known far enough in advance, it is possible for the treasurer to go about getting the funds in a systematic way and not be compelled to borrow on unfavorable conditions. With two full years of good financial management, the concern should be able to borrow the required funds at a favorable rate of interest. By the payment of a small dividend on the common stock and the accumulation of a reasonable yearly surplus, the credit of the concern should be such that additional stock could be sold advantageously or notes issued. By such planning it should be possible for the concern to get established on a sound financial basis.

One of the most serious causes of business failure is the lack of foresight in planning for ample working assets when the concern begins operations, or before its operations require the actual cash. Too many administrators think that the thing to do is to get control of the productive capacity and depend upon banks and suppliers to furnish the working assets. In particular cases, this plan may work well, but if the administrators expect the concern to have a sound financial history, they should, when the concern is organized, provide for ample cash to meet all obligations when due, at least, during the first year or two of operations.

The amount of assets that will be needed in a particular concern is not always a matter that may be foretold with a high degree of

accuracy. The problem, however, should always be subjected to expert guesses, based upon proper analysis. If a poor estimate is made of the asset requirements, the concern may be a financial failure before it starts operating. For example, a group of stockholders may be perfectly willing to put \$500,000 into a given enterprise, but they might let it be sold in receivership before they would make a fifty-per-cent greater investment in the enterprise. However, if the asset requirements had been made known previously, the necessary funds could have been secured. In the determination of the vested asset requirements particular attention should be given to the cash requirements of the business.

The Cash Cycle.—The cash cycle should be studied closely by the controller and the treasurer of every concern, and this is particularly true of a new concern. With reference to operations the cash cycle may run somewhat as follows: (1) cash on hand; (2) goods procured and expenses paid; (3) goods sold; (4) accounts, notes, and cash received for goods sold; (5) accounts and notes converted into cash. There are other factors that enter at each stage of the process, but this may serve to indicate the general nature of the cash cycle. The cash expended for fixed assets and their maintenance returns to the cash account in due course, or is lost by the wayside and reflected through the surplus account. The current assets may circulate through the cash account at a rapid rate. In order to determine the cash requirements properly, a careful study must be made of the velocity at which each of the various items circulates through the cash account. This calculation should be made on a monthly basis and should give due consideration to the probable business conditions. During different periods of the business cycle the cash cycle may vary in time to such an extent that the concern will be embarrassed for cash funds, but have a superabundance of assets, which, at a different period, would have already been converted into cash. For this reason, the treasurer and the controller should know the probable cash requirements at relatively short as well as relatively long periods in advance.

The different phases of the business cycle affect the cash cycle in different ways. When business conditions are good and money and credit are to be had almost for the asking, the cash cycle will move at a much more rapid rate than when money begins to be less easy to obtain. If business conditions can be forecast with reasonable accuracy, the administrators and the managers of a business should be able to control its cash cycle so that the finances of the concern will

be upon a sound basis and the conduct of its affairs carried on in a systematic and economical manner.

The Provision of Additional Current Assets.—At times the current demands for cash will exceed the amount available for use due to the working of the cash cycle, and the purposeful lack of funds when the demand for cash is above normal. Bank credit may be availed of for this purpose, and accounts and notes payable may be allowed to increase above their normal amount.

A business might use funds, that were borrowed on short term, to pay for the acquisition of fixed assets. From this it may appear that the distinction between "normal" and "above normal" asset requirements is somewhat academic. From the viewpoint of sound financial management, however, this is a distinction that may be of considerable value to management.

A certain amount of the current assets of a particular concern may be furnished by other businesses. For example, the materials, supplies, etc., purchased by a concern may add considerably to its resources. The goods and services which the enterprise sells to others, on time for example, will add a certain amount to its current assets. Each of these adds to the current assets and may, through the operations of the cash cycle, require the providing of additional cash from time to time.

The loans which the commercial bank make to a concern are for the purpose of furnishing credit for a short time only. If the current assets become of such a character that they cannot be converted into cash in the usual course of business, the enterprise may become insolvent. The bank may not be willing to renew the loan more than once, so that if cash cannot be quickly realized upon the current assets and loans cannot be secured readily, the enterprise is liable to be thrown into bankruptcy. Many concerns have been wrecked because the managers have disregarded the terms of bank credit.

Some concerns own so few current assets that they must borrow heavily in order to provide the asset requirements necessary for the conduct of the business. It becomes necessary for them to convert nearly all of the current assets into cash in order to liquidate their liability to the bank. Usually the bank requires a business to pay off all notes one or more times per year, depending upon the nature of the business, etc. This makes it necessary for such a concern to go out of business, so to speak, every time it has to liquidate its loans at the bank. Such a finance policy may be a dangerous one to pursue.

The Liabilities of the Business.—The budget balance sheet should show on the asset side the asset requirements which will be necessary to carry out the projected policies of the concern. This has been indicated above. Here the practical point in finance of the liabilities of the business arises. The liabilities and the net-worth section of the budget balance sheet set forth the means of financing the business. Some of those who have a claim to the assets are as follows: employees, for unpaid wages; taxing authorities, for unpaid taxes; vendors, for unpaid bills; banks, for loans procured; bond and long-term note holders, for loans procured; stockholders, for contributions of assets.

An important function of finance is to arrange the various liabilities of the business so that the claims of each liability can be extinguished according to its terms. The liabilities of the concern should be so arranged that the assets of the concern may circulate through the workings of the cash cycle in such a manner that the claims of each liability may be satisfied in due course of business.

The success or the failure of a concern may often be largely attributed to the wisdom used in planning the liabilities of the business. The decision upon the kind and amount of securities to issue is largely a matter of individual judgment. There are, however, certain general principles which it may be well to enumerate, in connection with certain classes of securities, before the subject is discussed from the accounting point of view.

Bonds.—Bonds should not be issued unless a steady and adequate income can be converted into cash for interest payments. The fixed assets of the concern should be of such nature that the bonds will be well protected. There is a large variety of bonds, however, and these requirements may be altered by the types of bonds that can be sold. For example, the debenture bond may be in effect a long-term note. From the point of view of sound finance, plans must be laid so that cash realized from income will be available to pay the interest when due. Typically the proceeds of the bonds should be so invested that a large part of the principal will have been returned through depreciation, etc., by the time the bonds mature. Good industrial bonds are usually serial bonds; a certain portion of the principal is paid every year. This makes the bond more attractive to investors, and gives a logical source for the investment of the funds that may be realized from depreciation and depletion, etc., of the assets acquired with the funds secured from the sale of the bonds. With this brief

discussion attention will be directed to the question of how many bonds to issue.

The kind and amount of bonds that should be issued will usually depend upon a number of factors, some of which are as follows: (1) the stability of the industry and the assets to be acquired with the proceeds of the bond issue; (2) the stability of the income and its convertibility into cash; (3) the ability to market various classes of bonds; (4) the financial policy of the company that issues the bonds. Each of these factors may be evaluated before a decision is made upon the liability structure. There is no set rule to follow in making an evaluation of each of these interrelated problems. The importance of each of these factors varies from time to time, from industry to industry, and from one class to another class of securities.

Long-term Notes.—Long-term mortgage notes may have the qualities of bonds. Long-term notes are usually issued in relatively small amounts and for a period of not more than ten years. The notes may be other than mortgage notes, if the credit of the concern is such as to make such an issue advisable. The amount of funds that a concern may require and secure on long-term notes will usually depend upon the other liabilities in the business, actual as well as prospective.

Preferred Stock.—There are two classes of preferred stock: cumulative preferred stock and non-cumulative preferred stock. Preferred stock may have different kinds of preferences. It may be preferred as to security, preferred as to dividends, etc. It usually bears a stated rate of dividends per share. One of the main reasons for issuing preferred stock is that the dividends are not compulsory, under certain conditions. The corporation cannot be thrown into a receivership because of the failure to pay preferred dividends. To attract investors the security should be good and the rate of dividend will have to be considerably higher than interest rates on better security.

Common Stocks.—The holders of the common stock are the residuary claimants to an interest in the corporate business. Since they normally bear a larger financial risk than the other liabilities of the business, the concern must offer them greater profit possibilities than is offered to others.

Determining the Relation of the Liabilities.—Accounting technique furnishes convenient ways and means of stating asset and liability requirements, as was pointed out previously. The financial phase of management is vitally concerned with the relationships that exist between the various liabilities of the business. For best results,

TABLE 20

A COMPARATIVE BALANCE SHEET SHOWING THE RELATIONSHIPS OF THE LIABILITIES OF THE BUSINESS TO ITS ASSETS

<i>Assets</i>	<i>This Year Amount</i>	<i>%</i>	<i>Last Year Amount</i>	<i>%</i>	<i>Increase Decrease*</i>
<i>Current assets:</i>					
Cash.....	\$ 4,041,105	6.7	\$ 3,373,552	5.5	\$ 667,553
Accounts and notes re- ceivable.....	6,333,075	10.5	6,563,091	10.7	230,016*
Inventories.....	5,006,145	8.3	4,845,647	7.9	160,498
Sub-total.....	\$15,380,325	25.5	\$14,782,290	24.1	\$ 598,035
<i>Fixed assets:</i>					
Land and buildings.....	\$ 9,228,195	15.3	\$ 9,507,281	15.5	\$ 279,086*
Machinery and equipment	10,193,235	16.9	10,672,690	17.4	479,455*
Other equipment.....	4,402,995	7.3	4,232,274	6.9	170,721
Sub-total.....	\$23,824,425	39.5	\$24,412,245	39.8	\$ 587,820*
<i>Other assets:</i>					
Investments in trust.....	\$18,094,500	30.0	\$18,094,500	29.5	—0—
Other assets.....	3,015,750	5.0	4,048,265	6.6	\$1,032,515*
Sub-total.....	\$21,110,250	35.0	\$22,142,765	36.1	\$1,032,515*
Total assets.....	\$60,315,000	100.0	\$61,337,300	100.0	\$1,022,300*
<i>Liabilities</i>					
<i>Current liabilities:</i>					
Taxes accrued.....	\$ 1,266,615	2.1	\$ 1,104,071	1.8	\$ 162,544
Wages accrued.....	904,725	1.5	613,373	1.0	291,352
Accounts payable.....	1,628,505	2.7	1,165,409	1.9	463,096
Notes payable.....	2,231,655	3.7	2,453,492	4.0	221,837*
Sub-total.....	\$ 6,031,500	10.0	\$ 5,336,345	8.7	\$ 695,155
<i>Fixed liabilities:</i>					
First mtg. 5% bonds....	\$ 6,031,500	10.0	\$ 6,031,500	9.8	—0—
Collateral trust 6% bonds	12,063,000	20.0	12,063,000	19.7	—0—
Sub-total.....	\$18,094,500	30.0	\$18,094,500	29.5	
<i>Net worth:</i>					
7% pfd. stock.....	\$ 6,212,450	10.3	\$ 6,212,450	10.1	—0—
Common stock.....	15,320,010	25.4	17,320,010	28.2	\$2,000,000*
Appropriated surplus....	9,107,560	15.1	9,107,560	14.9	—0—
Surplus, free.....	5,548,980	9.2	5,266,435	8.6	282,545
Sub-total.....	\$36,189,000	60.0	\$37,906,455	61.8	\$1,717,455*
Total liabilities.....	\$60,315,000	100.0	\$61,337,300	100.0	\$1,022,300*

the liabilities should be planned in advance of operations and control exercised over the assets in such a manner that the various liabilities will be kept on a sound financial basis.

It is often a serious matter for the finances of a business to be such that its resources cannot be used in an economical and profitable manner. If the assets of a concern are above its normal requirements, it may be that the relationship between the liabilities is unbalanced. It may have outstanding too much preferred stock, too much common stock, or too much long-term indebtedness, etc. In any case the corporation may be greatly embarrassed.

There are, broadly, two points at which the financial manager may be called upon to pass judgment upon the liabilities of the business. One point is before the concern is organized and the other point is subsequent to organization. From the viewpoint of a going concern the relationship of the liabilities of an enterprise may be illustrated by Table 20. The liabilities of the business are under three main headings: current liabilities, fixed liabilities, and net worth. Within each group there is a difference in degree of the liability. For example, the taxes may take legal precedence over the wages or the notes payable. The first mortgage bonds have a first lien upon the land and buildings, while the collateral trust bonds have a first lien upon the investments in trust. In the balance sheet the current liabilities are arranged somewhat in the order of their priority, and the current assets are arranged according to recognized liquidity. The fixed liabilities are set up according to the fixity of the liabilities, and the fixed assets are set up in somewhat the same order. The liabilities contained under the net-worth caption are preferred stock and common stock.

The first mortgage bonds represent 10 per cent of the liabilities and have first claim upon land and buildings, which at cost, less depreciation on the physical assets, is equal to 15.3 per cent of the assets. The immediate safety factor for the bonds is 1.53. The immediate safety factor of the collateral trust bonds is 1.5. In case of liquidation these may secure a further claim to assets than the ones on which they have a direct claim.

If the finance manager is called upon, before the concern is organized, to determine the relation of the liabilities, he will be able to approach the subject better by drawing up budgets similar to that shown in Table 19, and those shown in Chapters XXIV-XXXII. Before considering the finance function further, the balance sheet and income statement will be discussed briefly. It is assumed that the

reader has at least a working knowledge of good accounting principles, as set forth by reputable authorities.

The Comparative Balance Sheet.—The financial history of a business may be set forth in properly drawn balance sheets. If these statements are analyzed properly, and if they may be relied upon to reflect the "true" financial position of a business, they are valuable tools by which much can be learned about the financial stability of the enterprise. It should be understood clearly that the balance sheet is an estimate or an opinion as to financial status in the past. In some industries a budget balance sheet skillfully drawn for a year in advance of operations would be as trustworthy as the balance sheets that are presented. For example, the assets in some of the published balance sheets prepared by large corporations have been known to shrink as much as 70 per cent when sound accounting principles were applied to them, and large book incomes have turned into large book losses on the same basis. Since the administrators and the managers of the concern have a great deal to do with the nature of the published balance sheet, the controller occupies a fiduciary relationship to the stockholders and the general public.

Even when the most authoritative principles of accounting are applied to the balance sheet of a sizable concern, there is still room for differences of opinion as to assets, liabilities, and earnings. The questions of depreciation, depletion, and obsolescence of cost are not generally subject to anything but rough estimates. For these and other reasons the controller should see that every item in the balance sheet and relative profit and loss statement is, for all intents and purposes, what it is labeled and that it is so set up that intelligent analysis is possible.

The comparative balance sheet may be used to study some of the salient points in the financial structure of the concern. How this structure has changed from time to time may be read from the balance sheet. These changes may be made more apparent by means of the application of certain tests, some of which will be discussed under "ratios," and in Chapter XII.

The Profit and Loss Statement.—The balance sheet is drawn up as of a particular date; *e.g.*, January 1, year. It is a "static" statement. As it would be impracticable, in most cases, to have a daily balance sheet, the profit and loss statement analyzes the results of certain changes in financial position between two dates. It is a "dynamic" statement. In Table 21 is shown a comparative profit and

TABLE 21

THE COMPARATIVE PROFIT AND LOSS STATEMENT

Items	This Year		Last Year		Increase Decrease*
	Amount	%	Amount	%	
Sales.....	\$36,259,610	100.00	\$36,812,095	100.00	\$ 552,485*
Cost of sales.....	21,828,285	60.20	21,387,827	58.10	440,458
Gross profit.....	\$14,431,325	39.80	\$15,424,268	41.90	\$ 992,943*
Selling expense.....	\$ 3,335,884	9.20	\$ 3,607,586	9.80	\$ 271,702*
Management expense....	3,952,298	10.90	3,902,082	10.60	50,216
General expense.....	3,843,518	10.60	2,797,719	7.60	1,045,799
Total.....	\$11,131,700	30.70	\$10,307,387	28.00	\$ 824,313
Net profit from operation..	\$ 3,299,625	9.10	\$ 5,116,881	13.90	\$1,817,256*
Other expenses, net.....	1,160,308	3.20	1,251,611	3.40	91,303*
Surplus net profits.....	\$ 2,139,317	5.90	\$ 3,865,270	10.50	\$1,725,953*
Dividends:					
7% preferred stock....	\$ 434,871		\$ 434,871		—0—
Common stock, 10%..	1,532,001		1,732,001		\$ 200,000*
Total dividends.....	\$ 1,966,872		\$ 2,166,872		\$ 200,000*
Balance, net.....	\$ 172,445		\$ 1,698,398		\$1,525,953*
Surplus prior year.....	5,266,435		3,542,437		1,723,998
Adjustments.....	110,100		25,600		84,500
Surplus free.....	\$ 5,548,980		\$ 5,266,435		\$ 282,545

loss statement drawn up so as to show the general nature of the operations. The net sales of each year is represented as a unit ratio, or 100 per cent. Each item to surplus net profits is divided by the sales to find the proper percentage.

The profit and loss statement may be analyzed in great detail, and such analyses are often instrumental in showing the management some of the weak points of the business. For example, sales may be analyzed by products, by territories, and by salesmen, etc. Profits may be analyzed in the same manner as the sales are analyzed. This may show the management the results accomplished in such a manner that they may be enabled to profit by the information.

The analysis made by account classification will usually depend upon the size and type of the particular business. In a mercantile or in a manufacturing business, the various items that enter into profit

<i>Static Ratios</i>	<i>This Year</i>	<i>Last Year</i>	<i>Net Change</i>
1. Current assets to current liabilities	39.2%	36.1%	3.1%
2. Fixed assets to fixed liabilities	43.2%	42.6%	.6%
3. Net worth to fixed assets	65.8%	64.4%	1.4
4. Net worth to fixed liabilities	50.0%	47.8%	2.2%
5. Various assets to total assets, as: cash	6.7%	5.5%	1.2%
6. Various equities to total equities, as: first mortgage bonds	10.0%	9.8%	.2%
7. One specific asset to another, as: inventory to receivables	126.5%	135.4%	- 8.9%
8. One specific liability to one specific asset, as: bond to land and buildings	153.0%	158.2%	- 5.2%
<i>Dynamic Ratios</i>			
1. Sales to cost of goods sold	60.2%	58.1%	2.1%
2. Sales to various profit and loss items, as: sales to net operating profits	5.9%	10.5%	- 4.6%
3. Number of times fixed charges earned	3.086	4.769	- 1.683
4. Number of times preferred dividends earned	4.919	8.888	- 3.969
5. The profit and loss items of any one or more years taken as a base and an index number constructed of the other items for other years, as:			
Sales	98.5%	100.0%	- 1.5%
Surplus net profit	55.4%	100.0%	- 44.6%
<i>Static-Dynamic Ratios</i>			
1. Sales to total assets	166.3%	166.7%	-.4%
2. Surplus net profits to total assets	2.8%	15.9%	- 13.1%
3. Percentage earned on common and surplus	5.6%	10.8%	- 5.2%
4. Percentage earned on common stock	10.1%	19.8%	- 9.7%
5. Net profits to profits left in the business	8.1%	43.9%	- 35.8%
6. Sales to specific assets, as:			
Sales to inventories	13.8%	13.2%	.6%
Sales to receivables	17.4%	17.8%	-.4%

and loss may be grouped so as to have a summary statement somewhat as shown in Table 21. Each of the items, as selling expenses, may be classified into as many separate items as is necessary for adequate analysis. The various accounts should be described in an account manual, and should be in terms of the budget.

The relationship between the balance sheet and the profit and loss statement is definite. The balance sheet shows financial position and the results of financial changes, while the profit and loss statement seeks to analyze the effects that have been produced in the operations. The two statements in combination may be called a static-dynamic statement.

Financial Analysis by Means of Ratios.—The analysis of financial and operating statements by means of ratios has attracted the attention of many managers during the past decade. Some of the

measures that may be applied in the analysis of these statements appear below. The measures given have been applied to the data given in Tables 20 and 21.

It may be possible to detect weaknesses in a business if these statistical measures are prepared for several years covering companies in similar industries. Investors often analyze the statistics of various companies before an investment is made. Financiers are also interested in them, and for these and other reasons, the administrators and managers will do well to give their own statements critical analysis from the financial and investment standpoint.

The Relation of Accounting to Finance.—The functions of accounting and the functions of finance are quite distinct. But as soon as this stage is passed and questions of application of these sciences arise, their distinctions become less and less apparent. The financier must think in accounting terms, and the accountant who has a broad concept of his work does not content himself with recording results. Because of the great overlapping in the application of the two functions, and the ability of a controller to handle better the situation in practice, we have shown the finance function as one of the functions of the controller.

Organization for Financial Control.—In a sizable concern the controller will require a specialist to head the finance function. This specialist may be called the treasurer. He should have supervision of the cashiers, and the receipt and disbursement of all moneys. In practice it has been found advisable to deposit all receipts in the bank and make as many payments by check as conditions warrant. Payments are usually made upon the basis of vouchers prepared and approved by the general accounting department. These vouchers may be filed in a tickler under the date when payment is to be made, and on that date the check, which may have been filled out as a part of the voucher, will be signed and delivered to the payee.

The treasurer or his representative should make the pay-roll disbursements. The pay-roll records may be kept by a section of the general accounting department.

The treasurer may have control of credit and collections, but the controller should have a separate department for this work. The particular arrangement will depend upon the size of the organization and the necessity for highly specialized knowledge in this phase of management. The controller may well leave this work to the treasurer.

The Simplified Capital Structure.—A considerable number of

large corporations have issued so many different classes of securities that the question of the liabilities, in case of financial difficulties, becomes exceedingly complex. Such a situation can be avoided by having a small number of classes of securities and by having them very different in character; as, for example, first and second mortgage bonds, and preferred and common stock. Some financiers have been so busily engaged in selling every conceivable kind of credit which the corporation may agree to sell, that they have neglected to protect the corporation from a vast number of classes of liabilities. In a recent reorganization of a large corporation, there were over one hundred different creditor committees to deal with. If the asset and liability requirements of a concern are planned well in advance of operations, the capital structure may be kept simplified and at a saving to the business.

How to Dispose of the Securities.—An important matter to keep in mind is that of how and to whom the securities are to be sold. There are two main ways of disposing of securities. They may be sold to (1) bankers or brokers and (2) direct to private investors, stockholders, or others.

If the securities are of such a nature that investment bankers or brokers will market the securities, it is usually customary to sell the securities to them. This may be the most economical way to secure the desired funds. Where the securities of a corporation are listed on one of the important stock exchanges, if the corporation is fairly successful financially, its securities may be sold easily. This is an important source of funds to relatively large corporations.

If the securities to be sold are of such a nature that they cannot be sold advantageously to investment bankers or brokers, they may be sold to present stockholders or to the general public. Relatively small issues of sound securities and the new and additional stock of most corporations are usually marketed in this manner. Some concerns find that present and former stockholders will absorb the securities which the enterprise has to offer.

Deciding upon the Securities to Issue.—An important consideration is deciding what securities will sell best. This is too often the only consideration. From the standpoint of sound business enterprises, an important question to ask is: What will it do to the liability structure? If the financial policy of the concern is so planned that its main purpose will be to sell its services instead of its credit, the capital structure will usually be simple. The ability to sell its credit

upon advantageous terms is valuable to a concern. This phase of finance should not be allowed to dominate the financial policy of a business. If the liabilities of a business are scattered over as wide a range as the financier can sell credit, the concern may save itself considerable embarrassment by taking steps to simplify its liabilities.

Much that has been said in this chapter relates to financial concepts from the management point of view. The accounting phase of financial management is closely interrelated to the actual decision about financial matters. Accounting technique furnishes to financial management the story of the finances of the business in such a manner that the management should be able to anticipate, for a reasonable period in advance, not only the financial requirements of the business but also the effects which certain financial arrangements will have upon the concern.

The Control of Disbursements.—The funds which come into the business require executive control for their protection and proper disbursement. The proceeds from the sale of various classes of securities are usually expected to be spent in a specific manner. The basis for control rests upon properly drawn budgets and their enforcement. The treasurer should be able to control expenditures by the aid of these budgets. The finances of a concern may be such that rigid adherence to all budgets must be enforced or the cash requirements of the business will exceed its ability to secure the necessary funds. This may be disastrous to the enterprise. The administrators may wish to control the expenditures for the purposes of keeping the finances of the concern on a sound basis. The various activities of the business must be kept in proper balance and an effective way of doing this is to control the expenditures. The various budgets must be drawn up in such a manner that the finances and credit of the concern will permit of their being carried out. No matter how desirable and promising the program that may be set forth by the budgets, if the cash requirements of such a program cannot be provided, the program is unwise. Thus the enterprise is usually bound down to the financial policy of the business and its cash requirements.

The enterprise may provide for automatic solvency by restricting the expenditures and contracts for expenditure to a portion of the receipts. There is normally a spread in the cash balance due to the realization of profits, depreciation, etc. If the expenditures of money and credit are restricted within these realization limits, the concern

should have the necessary funds to pay all claims against the business. This is sometimes called "financing from within the enterprise."

Disbursements may be classified according to the purpose for which they are made. From the accounting standpoint they may be classified according to whether they may be classed as balance sheet or as profit and loss items. The control of the funds which may be realized from the destruction and deterioration of property should receive the careful consideration of the policy corps. If the concern is to remain in the business, ample provision should be made for the perpetuation and necessary expansion of the fixed assets, as well as for other asset and liability requirements.

The Control of Credit.—Credit control is secured by (1) the application of the science of selecting credit risks to the granting of credit, and (2) the application of effective collection methods to those who fail to meet the terms of credit granted.

Accounting furnishes the principal tools for the application of science to selection of credit risks. What has been said regarding the application of accounting to a business enterprise is also applicable to the study of credit risks. The financial statement is possibly the most prevalent basis for the granting of credit. Character, business acumen, and demonstrated ability to succeed financially are often of more importance as a basis for credit than the balance sheet itself. The balance sheet is becoming a requisite to the securing of credit by a sizable concern among banks and business houses. The banker who extends large credits to an enterprise may request a budget of proposed operations. The prudent borrower may well submit a budget to his banker as a proof that the proposed credit is needed and can be used profitably.

In a large enterprise sound credit granting may be based largely upon sound accounting analyses, if accounting be defined in a broad sense. The borrower who can turn funds to a good use should not hesitate to furnish the lender with such data as will enable the lender to select credit risks wisely. The lender or the credit grantor usually has a wide choice of those to whom accommodation will be granted. There are more prospective borrowers than lenders, so that many prospective borrowers must continually be refused credit. The prudent banker will usually be receptive to the borrower who knows enough about his business to present the banker with a statement of his cash requirements in advance of operations, if the banker believes that the program is sound and will be effected.

There are many phases of credit work and many sources from which credit information may be obtained, but a consideration of these would lead this discussion far afield.

The phase of credit control which has to do with collections is, to a considerable extent, in the field of management and somewhat beyond the accounting field. As in every phase of management, however, we find that accounting should be availed of for the information it may offer. The accounting records should furnish the treasurer or the collection manager with information as to collections, delinquencies, and other pertinent information. It is largely through the information furnished by accounting that the collection manager will decide upon the basis for action. The procedure followed in making the collection is not an accounting function, but accounting is vitally interested in the results produced, as well as in the prospective results of future operations.

The effectiveness of the credit department is not usually to be judged by the actual losses which are incurred in operation. The basis for judging effectiveness may be as follows: given a certain amount of business from acceptable credit risks, what should be the normal loss and what will be the possible deviation from this normal loss as business increases or decreases? Some credit managers can predict credit losses so closely that the variations in risk are of a very minor character; but from the standpoint of management control, these variations are significant. A variation from the forecast, when proper allowance is made for adjustments in the forecast, of one-eighth of one per cent may mean that the credit department is not as effective as it should be.

In many businesses today the prudent extension of credit is fundamental to the success of a business or an industry. Unless sound credit be extended to buyers and sellers, the effective demand for many goods would not be such that they could be sold in large quantities at a profit. The control of credit in all of its phases rests rather firmly upon accounting.

The Control of Income.—The control of the income of a business can be secured best by means of properly drawn budgets. The principles for the determination of income are as yet not authoritatively determined by our courts. Montgomery defines profits as follows:

The net profit of a business is the surplus remaining from the earnings after providing for all costs, expenses, and reserves for accrued or probable losses.¹

¹ R. H. Montgomery, *Auditing Theory and Practice*, 1919, p. 205.

In a particular case the determination of profits is not only a matter of concept but also a matter of opinion. It is nevertheless incumbent upon the business enterprise to state its net income in accordance with sound accounting principles.

The net income available for dividends upon the common stock is not as yet legally determined in a satisfactory manner. The matter of income determination and the dividend policy lies largely with the managers and administrators of the individual enterprise. Investors are often prone to buy securities largely upon the basis of the dividends paid, and the earnings reported. The importance of prudent administrators, and the application of sound principles of accounting to the business enterprise, may now be realized forcibly. A false or misleading statement of the earnings or the financial position of a firm may cause certain holders of securities of a business to profit at the expense of other security holders.

It is assumed that the net income has been determined according to the principles of good accounting practice. This income should be protected in accordance with predetermined financial policies. If it becomes advisable to change these financial policies, the policy corps should make the change in such a manner that the net effect of the change upon each liability, or each prospective security holder, will be of negligible importance. For example, a corporation has been paying an 8 per cent dividend on the par value of its stock. If the directors raise or lower this dividend at a particular meeting to take place in the near future, the effects may be the same in principle as "splitting a melon." It may result in legal financial manipulation, when judged from the basis of high ethical principles.

From the above it may be seen that the income, as well as the investment in an enterprise, may be controlled along three different lines, as follows:

- (1) Control may be exercised by strictly illegal methods.
- (2) Control may be exercised by legal methods, and
- (3) Control may be exercised by the application of policies that are based upon high ethical principles.

The control of income does not mean that dividends are not to be paid. On the contrary, the income of a concern may best be controlled by paying as high a dividend as is consistent with sound management. A concern that can pay an earned dividend regularly may put its securities into the sound investment class. The securities of such a concern may be marketed readily at a small cost. The conservatively

managed concern does not, however, pay out all the surplus net profits to stockholders. A portion of the earnings should be retained to absorb possible prior losses, to provide a moderate reserve for expansion, if desired, and to equalize dividends. This residuary is called surplus, which Professor Kester defines as follows:

Under the corporate form of organization "surplus" in its broadest sense represents the difference between the net worth of the business and the capital stock issued and outstanding. Because of the legal requirement that the value of the capital stock be shown always at the original amount—which is usually par—any increment or decrement in value because of profit or loss made and reinvested in the enterprise must be shown under separate heads. Thus surplus—or deficit—is the general term to indicate this increase in value.¹

Surplus in a sizable concern is often divided into "appropriated" and "free" surplus. The latter is the only amount that the stockholders may look upon as available for the payment of regular dividends. Some concerns use a considerable part of their earnings—appropriated surplus—to provide for the expansion of the business. Such a policy may work considerable injustice on the present and the prospective security holders. For example, it may decrease the sales price of the common stock and increase the market price of its bonds and preferred stock.

The control of the net income of a business is a requisite to financial success. The administrators, the managers, the employees, and the general public should not lose sight of this fact. The functions of the controller cluster about the important problem of financial control, which includes the control of income.

¹R. B. Kester, *Accounting, Theory and Practice*, 1920, p. 407.

CHAPTER IX

COST ACCOUNTING AS AN AID TO MANAGEMENT

The Concepts of Cost Accounting.—In Chapter II something of the nature and concepts of cost accounting was discussed briefly. These concepts were grouped according to whether the cost was to be ascertained largely (1) after the work is performed and (2) before the work is performed. In the present chapter the first concept will be treated more fully, while the second concept will form the theme of Chapter XI.

Financial accounting in its most general form gives little information that materially helps to solve other than finance problems. For the successful conduct of an enterprise, where competition is effective, something must be known of the internal work of the business. To meet this need, the concept of cost accounting was formulated. The fundamental steps that entered into the first cost accounting concept may be briefly stated as follows: (1) ascertain the amount of direct labor entering into the manufacture of the product; (2) ascertain the amount of direct materials entering into the product; (3) prorate to the product an equitable proportion of the overhead costs. To carry out this concept in practice many mechanisms, ways, and means have been devised. This latter phase of the work is regarded as system work.

The Objectives of Retrospective Cost Accounting.—There were two main objectives back of retrospective cost accounting. They were: (1) to ascertain the "actual cost" of products and (2) to secure a logical basis for inventory valuation. Later, the objectives have been extended to: (1) the ascertainment of an "equitable" cost, (2) the ascertainment of a possible selling price, (3) the determination of profits by lines of products, (4) the ascertainment of variations in costs, (5) the securing of data that can be used to indicate the necessity for management attention to such matters as better processes, better methods, etc., and (6) the ascertainment of cost to serve as a check upon accuracy of predetermined cost.

The desire to ascertain the actual cost of commodities led cost accountants to a retrospective outlook upon the subject. The "actual" cost of commodities was conceived to be nothing short of the total amount of the labor, materials, and overhead expended in a manufacturing enterprise. With such objectives in view, it is impossible to state the actual cost of commodities until a certain period of time has lapsed, as a month or a year. The concept is that if the total costs are divided by the total product, the result will be the actual per unit cost. No items will remain unallocated to the product. This is the reason that it is "actual" cost.

Cost methods which pursue the actual cost concept have developed considerable technique. There is usually a considerable number of methods that may be used to pursue the objective. Different methods usually give quite different results. If costs are to be on a somewhat comparable basis, the same methods must be used.

The question of a proper basis for the valuation of inventories was a definite objective of the retrospective cost accounting, as was pointed out in Chapter II.

The application of methods to the determination of "actual" cost, by men who were seeking for a "fair" statement of the truth regarding costs, soon disclosed that the actuality of costs is usually subject to much qualification. The word "actual" connotes something that is absolutely true. The concept of actual cost may be real but its application in practice is a myth. A different objective is needed. The term "equitable" cost would be much more accurate to apply to cost accounting than "actual" cost. For convenience, however, the words "retrospective," "post-mortem," or simply "cost" will be applied to this type of cost accounting. If cost information is to be of any considerable use to management, the concept and the methods applied to its determination must not lay claim to greater accuracy than the facts warrant.

Emphasis has often been laid upon the value of retrospective cost accounting as a proper basis for computing a reasonable selling price. It is stated that cost plus profit is equal to the selling price. The objective is one that may be overemphasized easily. The cost of a commodity usually fluctuates considerably more than the sales price. The sales price is generally subjected to competitive conditions. These factors make costs of less use in determining sales price than cost accountants are sometimes prone to emphasize.

Cost accounting methods are sometimes applied with the object of stating profits by lines of products. In many cases such information has been responsible for the change of the policies of enterprises and industries. It is comparatively easy to make quite costly mistakes by following this type of cost information, so that statement of unit cost for executive use and action should receive the careful consideration of the controller and the other major executives. This truth was illustrated by Table 3, in which the cost of a fan was stated.

Retrospective cost accounting is often used to direct the attention of managers to variations in cost. The object is to show that there is a variation in cost. The assumption is that a former cost is a reliable criterion by which to judge present performance. For this information to be of any considerable importance, the conditions must have been substantially the same. This assumption is quite often made by cost accountants and managers, when the conditions do not warrant the assumption. Conditions in the factory and in the business world are not static enough to fit this type of cost information with any considerable degree of accuracy.

The data that may be secured from retrospective cost accounting may often be of considerable value to management in pointing to the necessity for better methods of doing work. Unless the accounting information be of somewhat highly analytical character, the information that is secured may be obtained in a more economical manner by the use of a survey. Cost information of the proper kind may help materially in finding better methods of doing work. It has often helped to emphasize the probable profitableness of new machines, new processes, and of a new layout for the work.

Figures 16 and 17 may serve to give a mental vision of what may be considered as the results to be obtained from cost accounting. Without a cost system all is mystery between the dates of the two balance sheets. Profits and costs are a mystery, and the objects of cost accounting are largely to solve this mystery for management purposes.

Emphasis may well be placed upon retrospective cost accounting to serve as a check upon the accuracy of predetermined costs. In most cases it is advisable to secure a statement of how work is done and of the cost of the work as it is done at a particular time. Such a procedure is advisable before a study is made of how the work may be done better or more cheaply. Improvement should start from a knowledge of what is being done, otherwise the proposed improvement may not be an improvement at all. It may also be hard to convince the

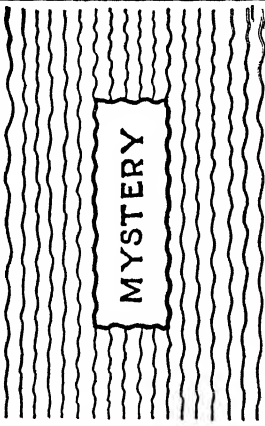
ORIGINATING TRANSACTIONS	MANUFACTURING OPERATIONS	FINAL RESULTS
USUALLY WELL CARED FOR	NO COST CONTROL	WELL CARED FOR SO FAR AS POSSIBLE
Purchases of Services →		→ Sales Less
Purchases of Materials →		{ All Purchases Plus or Minus Decrease or Increase in Inventory of what is Left Less Financial Expense Leaves Profit or Loss
Purchases of Money →		
Purchases of Miscellaneous Expenses →		

Figure 16. Manufacturing Flow in a Concern Without Cost Control.

ORIGINATING TRANSACTIONS	MANUFACTURING OPERATIONS	FINAL RESULTS
WELL CARED FOR	ADEQUATE COST CONTROL	RESULTS CLEARLY SHOWN
Purchases of Services →	Inventory Control Records Material Specifications Operation Standards Service Dept. Costs Operating Dept. Burden Costs Direct Labor Costs Direct Material Costs Selling Costs Administrative Costs	Sales Less Cost of Sales Plus or Burden Balances Net Manufacturing Profit Less Administrative Expense Selling Expense Financial Expense Plus or Miscellaneous Profit and Loss Items Net Profit or Loss
Purchases of Materials →		
Purchases of Money →		
Purchases of Miscellaneous Expenses →		

Figure 17. Manufacturing Flow in a Concern Having Cost Control.

These two figures are taken from Jordan and Harris—"Cost Accounting," p. 4. Revised Edition, 1925.

management that an improvement has been made unless there is a reasonably good basis for comparison.

Elements of Cost.—There are many elements which enter into the cost of a service. It has long been a practice to classify all of the costs into the following classes:

Prime cost:		
Direct labor.....	\$000.	
Direct materials.....	00.	\$000.
<hr/>		
Factory cost:		
Prime cost.....	\$000.	
Indirect charges.....	000.	\$0,000.
<hr/>		
Total cost:		
Factory cost.....	\$0,000.	
<hr/>		
Selling, Management, and General expenses	\$0,000.	\$0,000.
<hr/>		

Each of these classes of costs may include one or more sub-classes of costs.

The Importance of Unit Costs.—From early times men have been interested in unit costs. At early stages of industrial development men seem to have reckoned the amount of labor that entered into various commodities when exchange took place.¹

In a competitive industry the unit cost of commodities too seldom has anything definite to do with the sales price of the commodities. As industry grows more competitive and profits per unit tend to lower levels, the question of unit cost grows in importance. Many factories make thousands of different articles, no considerable number of which are made by a number of other concerns. The general pricing policy of most factories may be said to be that of charging what they believe that they can get for articles. If a reasonably good knowledge is had as to the probable cost of articles, this may serve to indicate the lower limits beyond which the sales price may not be allowed to go. In practice, many commodities are sold at a customary price. The cost of production of these commodities may be said to vary from factory to factory, and even within the individual factory itself. Unit costs may serve to indicate the profitable lines or commodities. Such a knowledge of unit costs may serve as a partial basis for changing the fundamental policies of an enterprise.

The Problems of Unit Costs.—The application of the concept of cost accounting to a specific problem often leads to difficulties. In

¹ See Adam Smith, *The Wealth of Nations*, Ch. VI.

some cases, it is comparatively simple to find the direct labor and direct materials that should enter into the cost of an article. The question of overhead costs may also be quite simple. In many cases, however, these items are not so easily obtainable. Questions of the classification of labor, materials, and overhead cost usually arise at the outset. In many cases, the questions of cost classification may be solved satisfactorily. The problems of overhead distribution give rise to many of the most important problems in cost accounting. Overhead costs are often such an important item in the cost of products or services that a large part of the energy of the cost department is devoted to the "distribution of overhead."

The unit to be used in stating cost sometimes gives rise to important problems in cost accounting. Some items may be conveniently stated as follows: by the ton, pound, ounce, square yard, foot, barrel, gallon, etc. Where quality enters, the problem of units of measure may be more complex. A points system may be used effectively under such conditions. An index number system may also be used, as indicated in Chapter XIII. It may be desirable to have all of the units as well as quality expressed in terms of points. By the translation of units into points it is possible to express a number of different classes of units so that mass data can be understood more easily.

Types of Cost Methods.—There are two main types of cost methods used in cost finding: (1) the order method; (2) the process method. Form 1 shows some of the industries in which these general cost methods may be applied.

Cost methods generally consist of three main parts, as follows:

- (1) Ways and means for ascertaining and for reporting the three elements of cost; namely, labor, materials, and overhead costs.
- (2) Ways and means of recording and summarizing these cost components.
- (3) Ways and means or a procedure for combining the elements of cost so as to ascertain a statement of the cost of each article or of each order.

The particular ways and means employed in securing these three aims will depend to a considerable extent upon the type of cost method employed and upon the requirements of the particular business.

The nature of the work performed and the information desired of the cost methods will determine the main features of a cost system. The manner in which the work is performed, and other factors must

General methods of cost-finding	1. Order method of cost-finding	Building construction industries Repair shops (including garages and machine shops) Plating shops Cabinet shops Garment manufacturing plants Straw and felt hat plants Boot and shoe plants Departments in wood-working plants Departments in metal manufacturing Assembling Departments
Used for the purpose of: Ascertaining by reports the material, labor, and overhead costs. Compiling and summarizing these cost elements. Determining the total cost of the job, order, or article.		
	2. Process method of cost-finding	Foundries Paper mills Paint and varnish manufacturing plants Chemical manufacturing plants Rubber and celluloid manufacturing plants Manufacturing of foodstuffs Coal-mining Ice manufacturing plants Treating departments Cutting and machine departments —wood-working plants

Form 1. Chart Showing Methods of Cost-Finding Applied to Various Industries. Taken from J. Lee Nicholson, *Cost Accounting*, p. 33.

also be considered. For example, in a foundry the work proceeds continuously for a number of years before the furnaces are closed. The cost components would be accumulated for a time, from which the cost per ton may be computed. It would be uneconomical to find the cost per ton of each batch of iron produced, and then ascertain the average cost per ton produced. In a garment manufacturing plant the product will not usually be standardized and the orders will be for definite quantities. In such a case, the labor, materials, and overhead cost may be assembled by orders so as to compute the cost per order and per garment.

Accounting for Labor.—In the production of goods and services a number of classes of labor are employed. The class of labor here referred to is that which is usually referred to by the orthodox cost accountant; namely, direct and indirect factory labor. In a sizable concern, records serve as a basis for accomplishing the following:

1. The determination of the amount of money due to workers according to the terms of the contract of employment.
2. The assembling of the information regarding wages in such a manner that it may be used for cost data.

The time clock and the time card provide information relative to the time that the worker claims to have spent and for which he may request payment. The wage contract, of course, governs much of the information that may be secured from time cards. The information is generally of such a character that the money due the worker can be calculated accurately. The particular wage agreement is usually not a question for consideration. Cost accounting may furnish valuable information about the effectiveness of different kinds of wage contracts, but wage contracts are management problems. Accounting methods furnish the ways and means for recording, manipulating, and making the data available in such form that the information can be understood by the management. The particular method of recording time will usually depend upon the kind of cost system employed.

Factory labor is usually classified into two main groups: direct labor and indirect labor. The term "direct labor" usually denotes the labor that is expended and can be traced to particular orders or operations. Indirect labor is all other classes of factory labor that cannot be traced easily to particular orders or operations. In practice, the classification of labor is not always easily applied and becomes somewhat complex. A definite classification should be provided, and

the manual of accounts should describe each item so that it may be easily discernible to which account each item is to be charged.

The various data that are recorded on the time cards to give information about wages, bonuses, etc., may be entered on records for the purpose of showing the amount due to factory workers. Certain classes of employees do not usually fill out time cards, etc., but some method is used to record the wages that each is entitled to receive and the account to be charged. This record is usually known as the pay-roll record. Much clerical work can be saved by the application of mechanical devices to the pay-roll problem. The cost methods and the wage payment plan also have much to do with the expense of keeping pay rolls.

One case is of record where the controller was able to reduce the number of pay-roll clerks, from over eighty to five, by changing from a complex to a simpler and more satisfactory wage plan, and by the application of mechanical methods to the recording and the computation of the pay roll. The number of employees increased, but the squad of five machine operators did the pay-roll work more accurately and better than it had ever been done before.

In some cases it is possible to analyze the pay-roll records into a few classifications and charge the factory labor to cost, direct from the pay roll. This is often the case where the process method is employed. Where the unit cost of a number of articles is desired, it will usually be necessary to post each item on the time cards to individual job cards. The particular methods used in finding costs may often be revised so that the expense incident to the securing of cost information may be reduced considerably without any sacrifice of accuracy or usefulness of the data, or the usefulness may be often increased and at a savings in expense.

Accounting for Materials.—The fundamentals of accounting for materials may be treated under three headings, as follows :

- (1) The control of stores.
- (2) Material reports.
- (3) Stock records.

Each of these topics will now be discussed.

In order to have an adequate accounting for stores, consideration must be given to the protection of the materials in store. These materials must be protected from theft, extravagant and improper uses. Care must also be exercised to see that the material requirements of an enterprise are supplied in an intelligent and economical manner.

This implies that such materials, as are necessary to fill specific orders or to fill the normal demand for materials for a specific time, will be purchased and kept in store.

In a factory there are usually many items that may be called stores. The various items may be classified as follows :

- (1) Raw materials.
- (2) Supplies.
- (3) Semi-finished parts, or in-process items.
- (4) Finished parts.
- (5) Finished products.
- (6) Scrap. Such items as obsolete stock, defective goods, by-products, salvaged materials, clippings, etc.

Ample and suitable space should be provided to keep the stores from damage and deterioration. This phase of the job is largely a management problem.

The control of stores has to do with the proper determination of the requirements of the business. This is secured largely by budgeting methods properly applied. The manufacturing budget should detail the specific kinds of materials needed and the approximate date when these materials will be required. Such information will assist the purchases manager in the purchase of materials in an economical manner.

There are a number of material reports that enter the cost records, some of which are as follows: (1) bill of materials or request to purchase; (2) purchases; (3) receiving; (4) requisition; (5) transfers; (6) credits; (7) cost sheets; (8) inventory; (9) disposition. These will be discussed briefly.

A statement of the principles underlying purchases procedure and the records is treated in Chapter XIX.

Material requisitions are orders to the store keeper to deliver specified materials. Form 2 shows a typical requisition. These requisitions should be made with the proper number of duplicates to facilitate the office and factory work. The bookkeeping for stores may be facilitated by the practice of using separate requisitions for the materials for each order. Since these orders are original records, they should be filled in properly and signed by the proper persons. Care should be exercised to protect them from destruction and from improper use.

A transfer order is sometimes required for the purpose of effecting transfers of material that may have been erroneously charged and

delivered to the wrong department. This order is somewhat similar to the credit order, with the exception that the use of the credit order may be confined to correction of errors made in material reports.

In some special cases cost sheets may be prepared for the purpose of summarizing and classifying materials. Cost sheets are usually prepared for the purpose of assembling the various items of cost, and for that reason the topic will be treated under cost reports.

Where the perpetual inventory records are verified from time to time by the physical inventory test, a material report may be prepared on which the results of the reconciliation between the physical and the book inventory may be recorded. Such a report form may save much time, effort, and expense in a sizable concern.

[illegible]

Form 2. Material Requisition.

The disposition report states the materials that have been used. This type of report is needed where materials are requisitioned and stored near the points where they will be used. It may be that some considerable time will lapse between the time the material is received and the time it is used. This type of report may serve to keep close account of the materials at the several stages of manufacture.

Overhead Costs.—Overhead costs may be divided into four main classes. These main classes together with some of the main subclasses are shown below.

I. Factory Overhead Costs.

A. Indirect labor:

- a. Labor not practicable to charge as direct labor, such as designing, layout, planning, experimental work, etc.

- b. Superintendence.
- c. Foremen.
- d. Inspectors.
- e. Factory clerks.
- f. Defective labor.

B. Indirect materials :

- a. Materials not practicable to charge as direct materials.
- b. Small tools.
- c. Supplies.
- d. Defective materials.

C. Indirect expense :

- a. Rent.
- b. Insurance.
- c. Taxes.
- d. Interest.
- e. Maintenance and repairs.
- f. Heat, light, and power.
- g. Transportation expense not charged direct to materials.
- h. Depreciation, depletion, and obsolescence.
- i. Other factory expenses.

II. Marketing Overhead.

A. Advertising costs.

- a. Direct advertising, classified.
- b. Indirect advertising, classified.

B. Selling costs.

- a. Salesmen's salaries, expenses, etc., classified.
- b. Sales commissions.
- c. Sales office expenses, classified.
- d. Shipping department expenses classified.
- e. Other expenses, classified.

III. Management Expense.

- a. Salaries of major and minor executives, classified.
- b. Professional services, classified.

IV. General Expense.

- a. Rent.
- b. Electric communication expense.
- c. Salaries of clerks.
- d. Printing and stationery.

- e. Postage.
- f. Other expenses.

This classification is intended to be suggestive only.

A considerable variation is often found in the way in which overhead expenses are classified. The benefits that may be derived from cost comparisons of various concerns will be negligible unless the same classification is used. There are in excess of one hundred and fifty uniform cost associations in this country at present. The members of these associations generally compare costs through the association. The individual members will seldom know the costs of other individual members. Such cost information has been used to correct some unfavorable conditions within a concern and within industries. Such uniform costs have led to illegal price fixing in some cases, as may be illustrated by the recent potteries case. Uniform costs may be used to advantage without becoming illegal.

A number of different bases have been advocated for the apportionment of overhead costs to the product. Some of these are as follows:

1. Direct labor.
2. Direct materials.
3. Composite of labor and materials.
4. Machine hours.

The procedure often followed, where retrospective cost accounting is now employed, is to estimate the total amount of the cost of goods to be manufactured during a given period and to divide that sum into the amount of the estimated direct labor; for example, to ascertain the rate to apply to future direct labor in order to determine cost. To this cost is added an amount or a percentage of the cost to determine the sales price. It should be emphasized, however, that this procedure is quite often a statistical matter, and does not enter into cost records that tie-in with the general books. Where it does enter such cost records, the procedure is to have accounts for the various overhead costs to which items are posted. An account may also be kept in which is entered in a summary form the various items that have been added to orders to cover overhead costs. When the books are closed, this account, together with the various overhead costs that appear in the books, are posted to an account called "Burden Clearing Account." The balance of this account will show whether the burden has been over or under absorbed. If a balance remains, "overhead distributors" generally advocate that the "actual" cost cannot be

found until this balance is distributed. Such a procedure, however, does not seem to serve a useful purpose.

Taking the Inventory.—Cost records usually provide ways and means for keeping a perpetual inventory, as this is one of the main purposes of cost accounting. Stock records are usually kept for all items in stores, such as raw materials, supplies, finished parts, and finished products. The general cost records provide for keeping account of the materials in process of manufacture. If the book inventory is periodically tested by a physical inventory, as explained above, the book inventory may be so adjusted as to reflect a cost valuation of stores on hand. The best practice of stating inventory valuations seems to be the lower of cost or market. The practical difficulties in following this practice often makes it advisable to value the “current” inventory items at cost and to write down the remaining items to a nominal or scrap value. The current inventory items should be composed of items which are required for use within a definite period, as a year. Articles that are obsolete, damaged, or un-current should be reflected in the books at a conservative valuation. Valuations are sometimes made at book value less an arbitrary percentage on the book value. This may be a good method capable of reflecting a valuation for purposes of stating profits, but the practice should be avoided and the stock records made to disclose the valuation.

Where the perpetual inventory is kept up to date and is found to be reasonably accurate, the inventory can be taken by tabulating the balances shown on the records. Such an inventory makes possible the preparation of balance sheets and income statements without the usual disadvantages of closing down a plant and the difficulties faced in making a consistent valuation of the inventory. If the perpetual inventory is not reasonably accurate for the items kept, a careful check should be made to disclose the causes for failure to secure proper results. The discrepancies may be due to many causes, such as: poorly devised system, system not enforced, dishonesty, ignorance, or poor clerks.

Interest as an Element of Cost.—The question of interest as an element of cost has been debated by cost accountants, but no definite conclusion has been reached as to whether the item should be used in cost accounting.¹ Care should be taken in charging interest to cost so as to make it possible to remove all interest from the assets

¹ J. L. Nicholson, *Cost Accounting*. See also the discussions by the National Association of Cost Accountants.

carried in the balance sheet. Several advantages and disadvantages of charging interest as an item of cost have been advanced. The charging of interest usually makes time one of the cost factors. The analysis of net profits from operation into interest and "risk" may serve to emphasize the importance of interest in the interpretation of operating profits. In the determination of profits by lines of products, the recognition of interest as an item of cost may serve to indicate the comparative profitableness of the several products. If interest were not considered as an item of cost, the interpretation of profits might be quite erroneous.

Cost Systems.—The assembling of the labor, materials, and overhead, in a sizable concern that manufactures a variety of products,

107723										FOUNDRY LABOR									
Order or Account No.					Ref. No.		Material		For Dept.		Drawing No.		Pattern No.		Date				
123426					345		321		42		12132		13264		4-26-29				
MISC SORT		MACH ORDER		C. SORTS-PART		M. L. C.		M. L. C.		M. L. C.		M. L. C.		M. L. C.		M. L. C.			
1 9 3 4		5 6 7 8 0		10 11 12 13 14 15		16 17 18 19 20		21 22 23		24 25 26		27 28 29		30 31 32		33 34 35			
No. on Order		Name of Part		Size of Machine		Foundry		Mach. No.		Mach. No.		Mach. No.		Mach. No.		Mach. No.			
3214		4321		3 1/2		12		20		2 2 2 2 2 2		2 2 2 2 2 2		2 2 2 2 2 2		2 2 2 2 2 2			
Machine No.		Man No.		Piece Rate		No. in Shop		Operation		3 3 3 3 3 3 3		3 3 3 3 3 3 3		3 3 3 3 3 3 3		3 3 3 3 3 3 3			
4564		2654		✓		6		Milling		4 4 4 4 4 4 4		4 4 4 4 4 4 4		4 4 4 4 4 4 4		4 4 4 4 4 4 4			
Dept.		Hours		Total Pieces		No Good		No Bad		5 5 5 5 5 5 5		5 5 5 5 5 5 5		5 5 5 5 5 5 5		5 5 5 5 5 5 5			
61		17		321		305		16		6 6 6 6 6 6 6		6 6 6 6 6 6 6		6 6 6 6 6 6 6		6 6 6 6 6 6 6			
Labor Cost		35.42		1/2		16		14		0		7 7 7 7 7 7 7		7 7 7 7 7 7 7		7 7 7 7 7 7 7			
Burdan		35.42		17 1/2		337		321		16		8 8 8 8 8 8 8		8 8 8 8 8 8 8		8 8 8 8 8 8 8			
												9 9 9 9 9 9 9		9 9 9 9 9 9 9		9 9 9 9 9 9 9			

Form 3. Foundry Labor Tabulating Card.

gives rise to an important problem; namely, in what ways and by what means shall the work be done. To the controller, this is a practical problem. The work must be done accurately and it must be reliable and immediate. To secure these aims, extensive use has been made of labor-saving devices; namely, forms, mechanical devices, and systems. Much has been done to make these labor-saving devices effective.

The application of properly devised and controlled forms has done much to make accounting data available for use. The cost of such data has often been in excess of what it might have been had better methods been employed. Mechanical devices have been able to secure more reliable data in a quicker time and at a large savings in cost. It is beyond the scope of this book to go into the details of systems, mechanical devices, and form construction. Attention will, however, be directed to the punch-card tabulating machines. These machines

have been developed so that much accounting data can be secured for a sizable concern at a low cost as compared to hand labor.

The elements of cost may be recorded on cards similar to those shown in Forms 3 and 4. Burden or overhead costs are applied to the labor and to the materials. These cards serve as original records. After they have been filled in by the proper persons, they come to the "punch" section. A punch machine may be seen at the right in Figure 18. The card is inserted in the punch machine and the girl punches holes which represent the data recorded on the card. The work may be checked by the use of a machine made for verifying the accuracy



Figure 18. An Electric Tabulating and Accounting Machine Installation.

of the work. The cards are then ready to be sorted. The machine operated by the man in Figure 18 is an electric sorting machine. This machine, for example, arranges labor cards for pay-roll uses and rearranges them for cost purposes. They may be sorted according to job numbers, part and operation numbers, according to departments and individual operators. The operating speed is at the rate of about 250 cards per minute. The electric tabulating machine may be seen at the left in Figure 18. After the cards have been sorted according to the desired classification, they are run through this machine at the rate of about 150 per minute. The information on the card which relates to the desired classification will be printed on a piece of paper. Thus, if the pay roll is desired, the cards may be sorted according to employees and the tabulating machine will record for each employee the information on the card, as follows: job numbers, hours, wages, and

total. From this data the pay-roll voucher may be prepared, and other statistical information obtained.

The cost of a given job may be secured within a short time after the final card has been received. The cards may be sorted according to job numbers and tabulated in such manner that the cost may be secured direct from the printed page.

The reader will bear in mind that only two types of tabulating cards were shown above. Other information may be secured from cards made to record such data. For example, cards may be prepared to record information relative to perpetual inventories, spoiled work, cost of idle machinery, labor turn-over, sales data of various kinds, profits by products, and other information. In most cases, the infor-

107718										STORES DISBURSEMENT									
* Order or Account No.					Ref No		Material		For Dept.		Drawing No		Pattern No.		Date				
133645					261		382		45		21643		4232		5-17-29				
3000										30 x 3 1/2 Clincher (2nds)									
Section										Shelf		Bin		Store		Remarks			
30										4		2		3					
Unit Weight					Frt., Exp. or P. L.					Delivered To									
.36										CBO									
Total Weight					Unit Price					Received By									
1080					03C					ROC									
Material Value					R. P. No					Posted By									
90.00										B									
999999999										999999999									

Form 4. Stores Disbursement Tabulating Card.

mation may be compiled in such form as to be of considerable value for statistical and analytical purposes. This will help the controller to interpret his data in such manner that it may serve as a basis for intelligent management action.

Cost Reports.—Cost reports are prepared for administrators and executives. The reports that are prepared for the chief executive may serve the purposes of the administrators. The major executives require quite detailed information, properly summarized, for their purposes. The minor executives require cost information relative to the operations of their own departments.

In making an evaluation of the various major functions of the business, the chief executive and the administrators need to know the cost incurred in the operation of each of its major functions. These costs should be arranged in such manner that they can be compared with the budget forecast. The importance of the variations from

the forecast has already been emphasized. The analysis of the causes for variations gives the executive a picture of how he has succeeded or failed in his efforts to secure predetermined results. Retrospective cost accounting has seldom given to the chief executive the control tool which he needed. It has not made provision for a logical analysis of causes for variation because it has provided no adequate base for comparison with results. The usual procedure is to undertake to make a summary comparison with the prior periods. In some cases such a comparison may be of considerable value, but this phase of the work has been overemphasized as an executive tool.

The nature of the reports in which the chief executive should be interested will depend largely upon the type of organization and upon the kind of services rendered. In a sizable manufacturing company which sells its products to the retailer through salesmen, the chief executive will be interested in cost information relative to procurement, marketing, labor and employment, and finance. The chief executive should study these reports as a whole, and any unfavorable trend should be analyzed further. The major executives will be more interested in the details than the chief executive, and the sub-executives should be interested in a further analysis and interpretation of summarized detail. The procurement manager should be interested in reports which show the direct, indirect, and overhead costs of each department in the organization that is under his direction. But his analysis of each of the departments will not be from the same viewpoint as that of the head of individual departments.

During the past ten years a number of managers have interested themselves in cost information for foremen. There seems to be no consensus of opinion as to what information foremen and heads of departments should receive. According to the principles of control previously mentioned, it would appear that the general principle to be followed is to give the foremen and department heads all the data that they require for the economical conduct of their functions. This data, if based solely on retrospective accounting, may not serve as a means of control, but it may serve as a basis of information that may help the executive in some ways. Reports based upon retrospective cost information are useful in many cases to locate weaknesses. It may be said, however, that retrospective cost information is usually of but limited use for management purposes. How its chief defects may be obviated will be pointed out in the following chapter.

Advantages and Disadvantages of Retrospective Cost Accounting.—Some of the chief advantages and disadvantages of retrospective cost accounting are as follows:

I. Advantages:

- a. It serves as a basis for determining the value of the inventory.
- b. It serves as a basis for ascertaining the capital value of assets constructed by the concern for its own use.
- c. It serves as a basis for determining profits by departments, classes of products, or other classification. This may serve to direct the profit policies of the enterprise.
- d. It may assist in the detection of costly wastes in labor and materials, uneconomical plant processes, location and layout, and selling methods.
- e. It may serve as a basis for the pricing of commodities.
- f. It may serve as a basis for detecting various trends in the cost of production to which executive attention may be directed for the purposes of cost reduction.
- g. It makes uniform costs possible and this enables the operations of one concern to be compared with those of another concern. This may serve a variety of purposes to advantage.

II. Disadvantages:

- a. From the management point of view, retrospective costs are post-mortem and do not serve well as a basis for the control of future results because of varying conditions.
- b. Too much emphasis is laid upon the distribution of overhead and the concept that no cost is reliable unless it be the "actual" cost. A faulty distribution basis may lead to erroneous and misleading results.
- c. In the great majority of cases, if the selling price is computed on the basis of cost, the prices will be out of line with competitors, unless the profits be the controlling variable.
- d. The cost of the information furnished may be in excess of the profits which it might bring to the business.
- e. The information furnished by retrospective cost accounting may be determined equally well by a different type of cost accounting that may be used much more extensively as a means for administrative and management control.

It is not contended that these advantages and disadvantages are equally applicable to every system that employs the retrospective cost concept.

Interpretation of Expense Accounting.—The information obtained from expense accounting represents a result. There may have been many forces at work to give the result. Then, too, the results obtained do not furnish proof that all the pertinent factors involved have been considered. For these and other reasons, a large factor of personal judgment must be supplied before the results may be evaluated. Probably 60 per cent to 75 per cent of the "total evaluation" is supplied by the interpreter of the cost situation. An analysis of the methods employed by a number of executives in the interpretation of a cost situation disclosed that not even 25 per cent of the total evaluation was based upon the cost information on the executive's desk. From this it appears that the greatest problems connected with the use of expense accounting arise in connection with the question of proper interpretation.

The general unavailability of expense accounting negates much of the use to which the data could be put. This unavailability further results in making the interpretative work rest largely on personal judgment and rule-of-thumb methods, because many of the factors and circumstances which influenced the expenses have been forgotten if they were ever known by the executive. If information regarding the expenses of a certain piece of work were made available "immediately" upon completion of the work, the executive could interpret the results in the light of his knowledge of transpired events. In practice, however, from a week to a month passes before the expenses connected with a job are made available. An evaluation of results is a post-mortem operation and is quite often not taken seriously.

The superintendents of several manufacturing concerns were asked to demonstrate the procedure which they followed in the interpretation of their cost information. One executive looked at the cost reports covering several orders and selected his demonstration case. His assistant was asked to bring the previous reports of the job. With these reports, the executive began to compare the dollars and cents items covering labor, materials, and overhead. He showed the amounts and the approximate percentage deviations between the costs. The computations were made by sight comparisons and the results recorded on a pad. His figures revealed that the most recent experience was not so good as the former experience by about 30 per cent, and the preliminary conclusion was that the cost was excessive. The

foreman in charge of the job was called to explain "why" he had made such a poor showing. The facts developed were as follows: some of the major operations were performed by more expensive men and machines than formerly; one part was spoiled; there was a price and a quantity variation in several items of material; there was a variance in the overhead rate. After considerable discussion the foreman left. The superintendent looked out of his office window; he spoke of some of the personal characteristics of the two foremen; he observed that in making comparisons of costs a large element of personal judgment was present; that this personal judgment was the result of experience, and that he thought the most recent experience was "bad." A study of the methods employed by the other executives interviewed disclosed that their interpretation of cost information was based largely upon their personal judgment rather than the purported facts presented in cost data.

Factors Needed to Minimize Personal Judgment.—Some of the factors which should be taken into consideration in the evaluation and the interpretation of results secured by expense accounting are as follows: (a) the volume of production; (b) calendar variations; (c) variations in efficiency in the use of labor, materials, machines, and other items of expense; (d) the standard itself. In the interpretation of expense accounting all of these factors must usually be made by a rule-of-thumb process.

The executive, consciously or unconsciously, uses some kind of standard in making comparisons and in evaluating results. If these standards be largely arbitrary or otherwise uncertain, the evaluation of results may be described in the same language. Unless research and study be made to determine a standard, little confidence, from the scientific viewpoint, can be placed in the standards selected. A major defect of expense accounting, from the viewpoint of expense reduction and waste elimination, is that proper standards are not available by which to evaluate results.

The influence of volume upon "cost" in expense accounting is not properly reflected, and therein lies another major defect in expense accounting. A variation in the volume of product may result in a significant variation in the expense per unit. In making an evaluation of results secured, as reflected by expense accounting, the executive has a most unsatisfactory way of giving this factor its proper weight.

Closely allied to the question of volume is the question of calendar variation, which is likewise neglected in expense accounting, but which should be considered in the evaluation of results. This is particularly true where volume is recorded in dollars only, but it should receive due consideration in other cases. The productive hours which a plant runs during the month due to calendar variation and holidays may vary from 3 per cent to 20 per cent. The result is that with the overhead distributed to the product, the cost may appear to have or not to have undergone significant variations, which is not the true situation.

The accounting components of "cost"—namely, labor, materials, and overhead expense—are presented in a pro-forma manner and purport to show the "expense" connected with the production of certain goods or services. From what has been said above, however, it is apparent that the content and the limitations to which expense accounting is subjected must be understood before a prudent interpretation of the data can be made. Seldom does the executive make a written record of his interpretation of a cost situation. The details which are necessary for a prudent interpretation are soon forgotten, and when the case is referred to again the executive is tempted to judge the figures without the collateral facts or he may not even consider the case.

The Interpretation of Labor Expense.—A number of interpretations can be placed upon labor expense—depending upon the purpose in view. The expenses may be interpreted in the light of the cost of living to determine whether they are "high" or "low." They may be interpreted for the purpose of comparing the labor cost of doing specified jobs at different times. Whatever be the purpose of the interpretation, it is necessary to know the basic factors which are embodied in the data before a rational evaluation can be made. The wage-payment plan has much to do with the interpretation.

If a piece-rate plan of wage payment is employed, then the interpretation of labor expense is somewhat simple. The amount paid for labor is the result of units of production times the piece rates. If any two factors be known, the third factor may be found. The information is provided by means which assume that the rate is "right." Whether or not this is "true" is subject to collateral facts and their interpretation.

Where compensation is based upon time, the interpretation of results is more difficult than where a piece rate is used. A number of variations take place and often result in a most unsatisfactory basis

for the interpretation of "cost." The wages paid do not usually provide an index by which two or more similar pieces of work can be compared. The rates of pay may have been different, the conditions under which the work was done may not have been substantially the same, and the skill of the workmen may have been quite different. A direct comparison of the labor cost, however, would fail to recognize these important factors, which are necessary for the efficient operation of a business. With so many and such important variables neglected in expense accounting for labor, the interpretation of and the comparison of results should be viewed in the light of more data than appears on the face of the figures. Otherwise, the conclusions reached may be so erroneous that the concern would have been better off without the information.

The task and bonus plan of compensation has many different forms. Usually a base rate is guaranteed, and to this extent it is a form of day rate. In addition to the base rate, the employee is paid a higher rate of compensation for additional output. Both compensation and output are often graduated. This form of compensation is devised to encourage high productivity from the employee. If all workers earned a bonus, the question of interpretation of the base pay would be fairly simple. It would mean that the standards set for the base pay had been exceeded. This comparison takes for granted that the base task was reasonable. If some workers fail to earn a bonus, then the question of the proper interpretation of the labor expense is almost as difficult as it is under the straight-time form of compensation. When a bonus is earned, the interpretation of results may be made in terms of the gradations set. The summary figures for the labor on a job, or during a certain period, may be supplemented by data regarding the performance of the personnel, in terms of the gradations in tasks set. Where the labor for several kinds of jobs are summarized, an interpretation of the figures may be made from a knowledge of the degree of attainment. Where this form of wage payment is employed, the interpretation of expense is made more certain and less difficult because standards are employed. Care should be exercised, however, to summarize the payments so as to reflect the expense by gradations in the compensation plan. The data in each gradation may be studied in the light of the standard set and other information, and an interpretation made of the data in its several parts and as a whole.

It is sometimes desired to compare the labor expense of a product during one period with the same item during another period. A direct

comparison of the expense may lead to an erroneous interpretation of the results secured. With a bonus system, it is not usually possible to determine the unit production from a knowledge of the rates paid and the amount of the payment. If the unit product and the total expense are known, the average per unit rate can be determined. A comparison of this average rate during two different periods may be made, but an interpretation of the results secured may be erroneous if the following factors are not properly considered: (a) the calendar variation; (b) the effect of capacity upon the willingness of the workers to earn the bonus; (c) the comparability of the two general averages.

The Interpretation of Material Cost.—There are a number of reasons why it is difficult to interpret the material cost item in expense accounting. In the first place, some standard is needed for comparative purposes. If two items be compared, there may be a tendency to use one cost as the base for judging the other item. Neither figure may represent a reasonable standard. In the second place, the monetary sum is a result of the multiplication of units by prices. In such a comparison there may be a variation in prices as well as in the units. The interpretation of expense accounting should take these items into consideration, but this is not possible unless the items be analyzed. If either the quantity or the price be held constant, the data becomes more intelligible because there is only one variable. For example, if prices be fixed for materials, then the variable reflects the efficiency in the use of materials. Then, too, the quality of the materials must be considered and if there is a significant variation, this variable should be recognized in the appraisal. In the third place, there is the practical question of making the accounts show the materials chargeable to the account. Spoiled work, excess stock, and other items may be represented in the accounts and make the results deceptive, when accurate comparisons are to be made and conclusions drawn therefrom. Another difficulty found is that where there is a variance; the cause for such variance has to be looked for and the executive usually tries to draw his conclusions from the results as recorded. Other difficulties may be found in particular cases.

The Interpretation of Overhead Expense.—Overhead expense covers certain other items of expense which are not represented by direct labor and direct materials. In factory accounting, it is customary to distribute this overhead expense to the product which benefits in the production process. There are several bases on which this distribution is made. If the distribution of factory overhead is made

on the basis of the direct labor, and all items are distributed, then the problem of interpreting the factory overhead is difficult because there are so many variables and so many items represented that their applicability to specific products may be questioned. The interpreter of the cost situation may not content himself with the dogma embodied in the method of distributing factory overhead. In such a case, additional computations must be made to reflect the concept accepted for the purpose in view, or a rule-of-thumb process employed to arrive at an interpretation of the cost situation.

If the factory overhead expense be distributed on the basis of the value of the direct material, then the interpretation of the cost situation is not only influenced by the viewpoint of the interpreter as to the reasonableness of the basis for distributing the overhead but also by the results secured. In nearly all cases where expense accounting is now employed, question should arise in the interpreter's mind as to the reasonableness of the methods employed in distributing overhead expense, whether it be factory overhead or other types of overhead. There is also present the question of the reasonableness of the expense. The accountant who does not have the viewpoint of management assumes that the management will interpret cost in the light of the results which he sets forth, and that these results are sufficient evidence as to the reasonableness of the items. Expense accounting, however, has too serious limitations to be accepted without question and acted upon by the management. Its limitations with regard to direct labor and direct materials are equally applicable to manufacturing expense.

When it comes to distributing commercial expenses for the purpose of determining profits by lines of products and other information, the question of the interpretation of results secured is as perplexing as it is in the distribution of factory expense. Under the usual methods employed, the accountant often appears more interested in getting the overhead completely distributed than he is in presenting information which may be truly useful in the formulation of policies and their appraisal.

Standard costs may be used to eliminate the chief obstacles met with in the interpretation and use of expense accounting. How this may be done is indicated in Chapter XI.

Individual Costs in Relation to Prices.—Cost accountants and business men often claim that costs can be used to determine the sales price of an article. This may be so in the case of cost-plus

contracts and to some extent in monopolistic enterprises, but as a general statement it is far from the truth. In business today prices are determined without regard to costs of the individual enterprise or to the "average cost in the industry." The only manner in which retrospective cost information can be of any value to management with reference to prices, except as qualified above, is in determining, in a rough way and over a period of time, whether or not it may be profitable to take business for the price at which it may be had.

CHAPTER X

PRICE ANALYSIS IN RELATION TO COST ACCOUNTING AS AN AID TO MANAGEMENT

The Problem in Its Setting.—The broader phases of management are centered about the problem of price, and if accounting is to serve management properly, consideration must be given to this central problem. Price analysis should be considered as a part of the broader phases of cost accounting.

Price Analysis.—One of the purposes of cost accounting is to determine sales prices.¹ The contention is that if to the manufacturing cost be added selling, management, general expenses, interest and profits, the result will be the amount for which the article should sell. This amount is considered by many people to be a fair price. The application of this idea to business enterprises gives rise to problems of considerable importance to business executives as well as the general public.

There are two main points of view relative to what is a fair price and how the public can be assured of fair prices. The first concept was developed by the economists to explain how prices could be regulated best. The assumption is that if there is a free flow of wealth, labor, and management ability from one business to another, and if competition be free and unrestricted, that, over a period of time, prices will be fair and reasonable. This analysis has long been accepted as the basis for legislation in this country. The Sherman Anti-trust Law was passed to keep big businesses from organizing so as to act in "unreasonable" restraint of competition. The Federal Trade Commission Act declared "unfair methods of competition in commerce" to be illegal. It created the Federal Trade Commission to prevent the use of "unfair" methods of competition. The Clayton Anti-trust Act provides, among other things, prohibitions against price discrimination, exclusive contracts with agencies and dealers,

¹It is not to be supposed that individual costs determine the price for which articles sell in a competitive market. Here prices are determined by the whirl of competition without regard to "fair" prices or "fair" profits.

holding companies, and interlocking directorates, where the effect is to substantially lessen competition.

The object of our legislation seems to lean very definitely to keeping competition from being "unduly" restrained. It should be observed that the "free competition" concept made much broader assumptions than the business man is willing to recognize, and that the industrial revolution and the present trend toward price and quality stabilization, as well as many other changes, makes the old analysis antiquated.

Dr. H. P. Willis¹ says:

It takes but little unprejudiced thought about the situation to recognize that industrial changes and modifications of business organization have gone far toward making these earlier ideas almost entirely obsolete. The tendencies which have worked in that direction are several; but they may be enumerated chiefly as follows: (1) growth in size of the business; (2) transportation and redistribution of business; (3) standardization of product. . . . The mere existence of what is called competition in the older sense does not today result in low prices to the consumer and has never operated to insure him a parity of position with every other customer. Neither has such competition invariably resulted in establishing conditions of steady and reliable supply.

Dr. Willis goes on to show that the laws which we now have upon the subject of "fair price" determination, when they are applied to price determination, are based upon erroneous hypotheses. Based upon the concept that services should be rendered at a price which would result in a substantial equality between the various producers, after allowing for differentials in ability to produce, he has formulated principles for the determination of a "fair price." A second point of view led to the following statement of the principles that should govern the determination of a fair price.

1. A fair price places all buyers in the same position with respect to one another, and puts them upon the same basis of equality regardless of bargaining capacity.

2. A fair price eliminates, as far as can be done without hardship to any one, differences in geographical position and thereby equalizes buying power as between different areas.

3. A fair price gives each group of buyers the advantages which come from larger scale production and thereby tends to equalize their buying power still further.²

The above principles if applied would tend toward a one-price policy, except for minor variations, for goods of like quality. This seems

¹ H. Parker Willis, "Just What Is a Fair Price?" *Nation's Business*, October, 1925.

² *Ibid.*, p. 36.

to meet the buyer's main test of fairness, but not his sole test of fairness. If to the above principles of a fair price be added the tests of fairness from the seller's point of view, as shown below, the results would seem to indicate a set of principles which would more nearly meet modern business requirements than the older idea of free competition. The principles which would seem to meet the seller's idea of fairness are as follows:

1. Limitation of price to a figure which will result in placing the largest continuous supply of a commodity in the hands of the consumers.¹
2. Subject to the foregoing qualifications further limitation of price to a figure which will yield about an average or standard return to capital as compared with capital in other industries.
3. Establishment of price at a figure which permits the steady introduction of new capital into the industry under at least ordinarily favorable conditions.¹

The first point of view hoped to secure a fair price for the buyer and the seller by preserving "free" competition; but, as stated above, this type of competition has failed to secure the anticipated results largely because the conditions in industry are not now, if they ever were, such as to justify the hypotheses upon which the "free competition" theory was founded. The second point of view seeks to establish principles upon which a "fair price" may be secured by buyers and for sellers. It is based upon "the general standards of conduct that are prevalent among the community today."²

The objection may be raised that the legislation in this country tends strongly against the acceptance of this later statement of the principles that should govern prices. If the choice of the methods of accomplishing the desired end were crude, this might be a cause of complaint. Our courts and commissions as yet have not decided the exact nature of the "unreasonableness" of prices. "Perfect" price agreements that unreasonably restrain trade are illegal under our present laws, but such agreements are not a prerequisite to successful business operations, else it is highly improbable that the above principles for the determination of a fair price would conform to the standards of the community. The enforcement of such a law, in an equitable manner, is extremely difficult. Methods of competition today, in many lines of business, amount to a regular price agreement, as far as its effectiveness is concerned. Then, too, it is next to an impossibility for the government to prove what amounts to "unrea-

¹ *Ibid.*, p. 37.

² *Ibid.*, p. 36.

sonable" restraint of trade, where the proper forethought and care is exercised in the agreement.

Fair prices are relative. That is, they depend for their fairness upon a number of considerations pointed out above. "The price question should be entirely separated from the question of the form of industry whether competitive, semi-competitive, or monopolistic, and it should be recognized that genuine competition in the true sense of the term is not limited to groups of producers contesting against one another, but is quite as truly to be found in the relationship between the community as a whole and the industry itself, and quite as truly in the relationship prevailing between different industries."¹

The Law of Profits.—For centuries private industry has been carried on for profit. Today, reasonable profits are recognized as a requisite to the successful operation of business enterprises. From the viewpoint of those who furnish business enterprises with assets, a satisfactory profit is the prime requisite to the successful conduct of business. If these be true statements, which they unquestionably are, the first claim upon the public is a reasonable profit upon the assets reasonably essential to the conduct of essential business enterprises, but in many businesses these ends are not attained because of faulty profit ideals. According to the "free and unrestrained competition" idea, profits occupy a residuary claim upon the public. Such an analysis appears to be responsible, to a considerable extent, for the present ailments of many of our business enterprises. Since reasonable profits must be earned over considerable periods of time, if the capitalistic form of industry is to be maintained and used to serve the best interests of the community, it seems evident that profits are the first claim upon purchasers for the rendering of essential services or the production of desired commodities.

Mr. Alford has stated the law of profits in the following words: "A steady and reasonable profit can only come as the reward for rendering essential services."² The National Machine Tool Builder's Association expresses the profits idea as follows: "The reward of business for services rendered is a fair profit plus a safe reserve, commensurate with risks involved and foresight exercised."³ The latter statement of the law of profits seems to be a better statement of a fair profit than the former statement. If the test of "essential services" is the return

¹ *Ibid.*, p. 37.

² L. P. Alford, "Laws of Manufacturing Management," p. 24 (a paper read before the Taylor Society, 1926).

³ *Ibid.*, p. 24.

of a competitive profit, then it may exclude services of a highly useful character to many people.

Business men have long recognized that under "free competition" the mere rendering of excellent services does not necessarily result in a profit. Price wars, unintelligent and ignorant competition may reduce the money price of the service and result in no profits to many concerns, losses to other concerns, and meager profits to the best-managed concerns. The general public has to pay the bill for these billions of dollars of wastes that take place in industry due to maladjustments caused by "free competition." Because of these tremendous losses, the prices of commodities are higher than they might be and the general public is deprived of a continuous flow of commodities at fair prices. The flow of goods is less than it might be and the prices paid are higher than fair prices.

Mr. Gaskill¹ says: "I have come to a point where almost every analysis of a phase of the so-called conflict between government and business as expressed in the anti-trust laws can be resolved in terms of a failure to apply continuously and generally the right relation of cost to price." From this it appears that profits, if they occupy a reasonable relation to cost and price, are not "unreasonable" restraint of trade. These factors will doubtless be used in the future in tests of the "unreasonableness" of prices. Jordan² says: "A reasonable rate of return will neither encourage nor discourage production and will tend toward stability." This principle, though fundamental, has not received the attention which it deserves. The law of profits, when recognized more fully in business, will do much to stabilize business. This will eliminate many wastes that now take place in business and cause increased buying power to be placed in the hands of consumers for the public benefit.

In view of the foregoing statements, the law of profits may be stated as follows: The rendering of services to the community entitles the renderer of those services to a primary claim upon the community for a fair average return upon the assets required to render those services in a reasonably economical manner.

Because of the chaotic condition in which many industrial managers have found their industries—due to the "free competition" concept, ignorance, and unintelligent competition—hundreds of manufacturers' associations, cost accounting associations, and other asso-

¹ N. B. Gaskill, formerly Chairman, Federal Trade Commission, N. A. C. A. Yearbook, 1926, p. 18.

² D. F. Jordan, *Business Forecasting*, p. 51.

ciations, informal and formal societies of various kinds, have been formed to protect business from these evils. Consolidations, mergers, and other types of legal organization have been availed of to protect and make profits for businesses. In many cases, the devices used to secure profits for businesses have resulted in unfair services and unfair prices to the general public. From a reasonable knowledge of the failures of the free competition idea to accomplish its aims, it may be said that until our legal procedure recognizes the principle that a reasonable profit is the first claim upon the public for the rendering of services, the injustices and absurdities of private ownership for profit will continue unabated in the future as they have in the past. When this principle of profits is recognized, a different type of legal regulation will come into being to make the business machine more effective in rendering adequate services to the community continuously at reasonable profits.

Normal Costs.—Normal costs are of considerable importance in the determination of fair prices and fair profits. Normal costs are here referred to as costs that should be obtained over a series of years or over one or more business cycles. If a normal profit be added to the normal cost, a fair average selling price is obtained. Normal cost of rendering services¹ includes the normal costs of the following: manufacturing cost (labor, materials, and factory overhead costs), selling, management, and general overhead costs.

The concept of a normal profit, a normal cost, and a normal sales price is relatively simple. The application of the principle underlying these various "normals" to a practical problem for the test of a fair price is not as complicated a problem as some writers have supposed. It is not to be supposed, however, that all that is necessary to determine what are fair prices and fair profits, is to determine the "normal factory cost" for each firm, and to that sum add an amount to cover normal selling, management, and other costs. Such a procedure would likely result in each firm charging different prices for similar services and would not result in fairness to the buyers or to the sellers. Many advocates of "free" competition and retrospective cost accounting advocate such a procedure, but the errors of such methods are many. Such methods do not meet with the requisites to fairness as indicated previously.

Normal costs should not be based upon the normal costs of the firms that turn out commodities at the highest or the lowest unit

¹ "Services" is here used to include goods, wares, and merchandise.

normal cost. The productive facilities of the various producers should be evaluated for the purpose of determining their respective capacities to produce services at a given cost. The evaluation which particular concerns should receive may be large or small, not according to the total book value of that concern, but according to the economy with which it can produce the required service. The determination of the amount of commodities or services that may be sold at particular prices may be determined approximately by careful market analysis methods. The several variables may be evaluated and a fair price determined after giving due consideration to the several factors enumerated.

One check upon the fairness of prices and profits is to be found in the normal cost concept. A somewhat kindred analysis of "normal cost" is to be found in the works of certain economists.¹ Their assumption is, however, that over a long period of time, under free competition, the prices which prevail will be fair prices because competition will cause the best services to be rendered at prices which are equitable. "In the long run," prices, by the reasoning process, will tend toward a minimum. To get these results, assumptions have been employed; namely, (1) a "static society" in which inventions, new discoveries, and better methods are stationary; (2) "other things being equal"; (3) other assumptions which history has failed to substantiate. Professor Willis has expressed the failure of such an analysis to meet the needs of business in the following language:

The business man today who wishes to be a law-abiding member of the community finds himself wholly at sea as regards his relations with his customers. He can obtain conflicting opinions about as numerous as the lawyers he chooses to employ, while, it must be added with regret, he has found professional economists loath to struggle with the practical problems of actual business, particularly in the price field, and inclined to take refuge behind abstractions, references to "scientific" principles whose nature they are unwilling to state or to apply. The result has been to leave the business man confused, and in many cases defiant, with respect to the whole situation.²

The explanation is offered that current prices are determined by "supply and demand." The business man has used these terms for some time now, but he has recognized that this abstraction often fails to explain the yield of fair profits and fair prices, unless his concept of fairness be based upon the idea of "charging all that the traffic will bear."

¹ See, for example, Alfred Marshall, *Principles of Economics*.

² *Nation's Business*, October, 1925, p. 36.

As stated above, normal costs plus normal profits may be employed to determine the fairness of profits and prices over a period of time. For the purposes of administrative, management, and legal control, the fairness of current prices and current profits may be judged by their deviations from normal as compared with the deviation of business conditions from normal. Such comparisons, however, should be made in various industries and the enterprises in those industries as well as between the various industries.

The concept of normal cost and normal profits, fair prices and fair profits, as they have been discussed above, has not been used by the governmental bodies in this country, except to some extent in tariff legislation, for the purposes of business control.¹ In Germany the cartel system is controlled by principles whose aims are somewhat as set forth above. Business men in this country have long recognized these principles and have, by one means or another, exerted considerable control over business for their own protection and profit. The law of profit coupled with the desire for private gain are stronger forces in business than any legislative machinery that any government has yet effected unless the basis for such legislation recognized fully the major practical problems connected with the price system.

Some Reasons for the Present Interest in Cost Information.—

In competitive businesses, if prudence is to be exercised, it has been found that better results are secured where cost information is compiled in a uniform manner than where each competitor computes his costs by different methods. In modern business, wise administrators and executives do not compete long on unprofitable business.² They have found that the only safe way to compete intelligently is to know what it will probably cost to render the required services. In some individual cases it is very desirable to know this cost quite accurately, but in many businesses a close approximation to the probable cost is quite sufficient for management purposes.

Practical executives who deal with the problems of price, costs, and profits soon learn that there are several problems which are so closely related to these factors that all of the factors must be considered together before they can be segregated. The cost of an article, for example, will be affected by the volume that can be sold, and the volume that can be sold will in turn be affected by the price for which the volume can be sold, which in turn may be affected by the profits

¹ Some public utilities are being controlled by the fair profits ideal.

² Most business men, however, too seldom realize the evils of unwise competition.

factor and other interrelated factors. These several factors are affected by similar factors in other concerns. In simple cases, such as where a specialized product is produced, the statement of standard cost for a particular business is not a very complicated problem. But even in this case, such a statement of cost may be of very limited management use. Some other concerns that produce several articles may produce a competitive article and "distribute overhead" in such a manner as to indicate a profit at the sales price, and thus make it impossible for the one product producer to earn a fair return upon the assets employed. If a number of enterprises sell a certain interrelated combination of products, and some of these enterprises sell certain other products, it may easily happen that the independent products may be made to bear the losses the unfair priced products caused. In this manner, certain of the sellers of interrelated products may be forced out of business or allowed to earn no profit for a considerable period. From the viewpoint of fair prices, this would be unfair competition. The trouble may be caused largely by ignorance of proper costs, profits, and selling prices. Out of this type of competition and the desire to know what it should cost to produce and sell at a reasonable profit, has come the demand for better cost accounting. These are the main causes for the present interest in standard costs and the comparison of cost information.

CHAPTER XI

STANDARD COSTS AS AN AID TO MANAGEMENT

Object of Cost Accounting.—The objects of cost accounting, as previously stated, are as follows: (1) to aid in the preparation of inventories, profit and loss statements, and balance sheets; (2) to aid in establishing selling prices; (3) to aid in determining profits by commodities, etc.; (4) to aid in detecting wastes and losses, such as wastes and losses in materials, time, etc.; (5) to aid management by providing a basis for future action. Cost accounting procedure was formerly interested in stating factory manufacturing costs, but during the last decade attention has been directed to its application to the determination of selling prices.

The procedure developed for retrospective cost accounting has usually resulted in a heavy expenditure for clerical labor, supplies, and other expenses incident to the maintenance of this accounting service. Due, in a large measure, to its retrospective character, and failure to accomplish its main aims in many businesses, this type of cost information is giving place to a new type of cost procedure. This new procedure is known as standard or predetermined cost. Some of the reasons for the interest in standard costs may be seen below.

Burden Distribution.—For many years manufacturers have figured factory costs by computing the labor and materials and adding an amount for overhead. In modern manufacture the "overhead" is usually higher than the labor or the material that goes into the manufacture of goods and wares. This "overhead" or burden is essential to production, and the necessity for stating the "proper" amount of burden that is applicable to a given product, in order to determine its cost, has led to a considerable variety of methods of distributing or prorating overhead costs. The basis upon which overhead is distributed may not be conclusive of "cost." In competitive industry, one method of distributing overhead may result in an apparent profit, while another method of distributing overhead may indicate an apparent loss. The method employed in distributing overhead is often arbitrary and frequently fails to indicate reliable cost information that can be

used wisely by the management. For example, a method of distributing overhead may be employed which fails to: (1) show the effect of idleness and (2) to show losses due to inefficiency in the use of labor, materials, and facilities.

From what has been said above, it is not to be supposed that "actual" cost is to be considered as pure and as unadulterated as the name might imply; namely, that actual cost is something which merits confidence because it is an actuality. The importance of an adequate method for the distribution of overhead costs is not to be minimized, but such methods should receive the careful consideration of the controller and be thoroughly understood by the other major executives. The methods should be simple and consistent with the presentation of an approximation to an ideal.

The Concept of Standard Cost.—The idea of standard or predetermined costs grew out of engineering analysis which had for its purpose the control of manufacturing costs. Gantt focused attention upon certain of the defects of retrospective cost accounting when he stated that:

The indirect expense chargeable to the output of a factory should bear the same ratio to the indirect expense necessary to run the factory at normal capacity as the output in question bears to the normal output of the factory.¹

Mr. Alford has stated this principle as a law of manufacturing cost in the following words: "The manufacturing cost of an article includes only those expenses actually necessary for its production."

Many business men advocated the application of this principle during and after the depression which began in 1920. They followed Gantt's idea of not burdening costs with the expense of idle facilities, and the principle of pricing to get orders to stop the loss from being what it would be without the orders. That is, they could better afford not to make any profit than to lose the fixed overhead costs which would be absorbed by the order.

Many clear thinking executives have recognized the shortcomings of retrospective cost accounting. They have not recognized the ways and means for its application to specific enterprises and industries. This type of cost accounting has, however, received a very considerable recognition by business concerns, business associations, and the Federal Trade Commission. From the standpoint of executive control, this type of cost accounting is not effective in many businesses and industries. To cure this very serious defect, the concept of stand-

¹ H. L. Gantt, *Organizing for Work*, p. 34.

ard cost is being extended, and ways and means for making it most effective in use are topics for discussion in many quarters at the present time.

A concept of standard cost, at any given time, for a particular commodity or service, in terms of its sales price, may be stated as follows :

The standard sales price of a commodity is equal to :

1. A fair normal profit on the commodity, plus or minus,
2. An adjustment in the amount of the fair normal profit to provide for the estimated deviations of the particular period from normal, plus,
3. A standard price for the material for its production, plus,
4. A standard price for sufficient direct labor for its production, plus,
5. The proper proportion of the fixed overhead costs (factory, selling, management, and general) applicable to the commodity on the basis of a period of years, preferably a cyclical period, plus,
6. The variable expenses applicable to the commodity.

The above factors should operate to determine the amount of a commodity for which the public should be ready to pay the fair price. This concept is applicable to the production of specific articles by those who are engaged in bringing them to market. The principles that should govern the individual enterprise are somewhat similar to those enumerated above. There are, however, some important differences which should be indicated. First, the fair normal profit of each concern may vary. Some producers may have economic advantages over other producers, such as better locations, better management, better equipment, and other recognized advantages. These factors should be evaluated before a fair normal profit can be ascertained. Second, business conditions may affect different concerns in different ways, and this should be evaluated to ascertain the deviations from normal. Third, the standard price of labor, materials, and overhead costs may vary and these variations should be evaluated in ascertaining a fair price. The above is a brief statement of the concept of standard costs. The principles on which standard costs are based and some ways and means for securing them are given below.

The Practical Application of Standard Cost Concepts.—It should be understood that the “fair-price concept” of standard costs,

as given above, is only one statement of the standard cost concept. From the standpoint of the practical application of standard cost to a business enterprise, alternative concepts are possible. Much useful information can be secured when, for example, the "free competition" concept is applied. Of course, "free competition" can be intelligent competition at the same time. Furthermore, standard cost may be quite generally adapted to different industries, whether competitive, semi-competitive, or monopolistic, but better results may be secured in some cases than in others. This is true because standard cost approaches cost problems from an engineering or the true analytical point of view. It employs the business science in the solution of its problems. In competitive or semi-competitive business, the application of the fair-price concept of standard cost offers to producers fair profits for the services rendered, and it offers to consumers reasonable services at fair prices. In a monopolistic business, standard costs may serve as a reliable guide for the pricing of commodities so as to secure a closer approximation to a given end.

The Principles of Standard Costs.—As explained in the previous chapter, there are two basic methods of computing costs. The first is the job-order method, which is employed where a shut-off can be made when a specific quantity has been produced. The second is the process-cost method, which is employed where a shut-off can be made at the end of a specific period of time. The ways and means for applying each of these methods to a given problem are somewhat different, but each method may be used in the compilation of standard costs.

Business executives recognize that the control of costs is essential to the control of the business, and that control can be most effective only when it is known "beforehand" what the costs should and will probably be if controlled properly. The inadequacies of the means for comparing cost information is often faulty where the retrospective cost type of cost accounting is used. Standard costs furnish an essential tool for the comparison of what "should be" with "what is." This measure gives the executive a suitable base for judging results. These results may be compared hourly, daily, weekly, monthly, or for any other period, with the standard; and executive action may be applied to insure forecast results. A knowledge may be obtained as to causes for any variations from standard costs, and this information may be used to interpret the results and assist in further perfection of performance.

Since standards are relative they may change. Best results will usually be obtained if proper care is exercised in the setting of standards that affect labor. One of the prime principles of labor management and wage payment is that rates, and the amount of work required to secure those rates be dealt with fairly. For example, piece rates may not be reduced fairly unless the methods of doing the work are altered by management or some fundamental change in industry seems to require an adjustment in the set standard. The idea of a standard in cost accounting is something which can be used as a reliable guide for a period in the future. When this standard no longer serves as a reliable guide, it should be changed so as to accomplish its purpose. The more reliable the standard is, the better it will serve as an administrative and management tool. But because certain of the data on which the standard is based get out of line is no reason why that part of the data may not be brought into agreement with a reasonable standard for the future.

Executive action will often be required to make cost standards effective. This indicates that the management must be convinced that cost standards are worthy of their cooperation and support. Since standard costs are devised and maintained for the use of management in the control of results, it might be thought that such standards would find hearty support from the management. That will depend largely upon the attitude of the management toward the subject. If the management thinks that sufficient control of the enterprise is secured by grandfather tools—the cash account and a good knowledge of the details of the business—those tools will be used. In a sizable concern and in other concerns where fair profits and fair prices are to be secured, a knowledge that is secured from standard costs seems essential to the successful conduct of a business enterprise.

The profits ideal of the businesses within a given industry will affect the cost to the purchaser. If their profits ideal is higher than that of business in other industries, their profits will remain higher over an indefinite period.¹ From the standpoint of costs which will yield

¹ Some writers maintain that capital flows easily from one industry into another and that capital seeks the most profitable investment. This is a very general abstraction. A fair knowledge of conditions today, as shown by published financial statements and other information, discloses that this general notion of a fairly even distribution of capital according to the profitableness and investment worth of the businesses in various industries is not so evenly distributed as has been supposed. Securities are sold which bear almost identical rates of interest, but they cover a wide range if rated according to the investment value. A few simple analyses will disclose "sleepers" in the stock market and in the investment market. The truth of these statements may be verified by reference to J. H. Bliss, Financial

fair profits and fair prices, it should be observed that the return of one industry should be comparable with the returns secured in other industries, as previously pointed out.

The principle of normal capacity was indicated above. It is an important factor in standard costs and has done much to cause manufacturers to be receptive to the idea of standard costs. The principle of idleness costs is closely related to the idea of normal capacity. There are many phases of idleness costs, a large part of which are a part of the normal capacity idea. A clearer idea of what is meant by normal capacity may be secured by a simple illustration. The manufacturer of a commodity, which has "no" competition, has a factory which can produce 160,000 units per year at 80 per cent capacity, which is the practical capacity of the plant. By a careful market analysis he ascertains that during the next three years the probability is that he will be able to sell, at a particular standardized price, a monthly average of 8,333.3 units. This indicates that his normal capacity over the next three years will be $\frac{5}{8}$ or $62\frac{1}{2}$ per cent of the practical capacity. With this data, and a knowledge of the normal overhead costs, the current production and the current overhead costs, he may distribute his overhead costs in such a manner as to conform to the idea of standard cost.¹

An important principle of standard costs is that a standard is provided by which to judge performance. In many cases the performance will be so close to standard that little or no executive action is needed. This principle makes use of the law of exceptions recognized by F. W. Taylor and stated by Mr. Alford in the following sentence: "Managerial efficiency is greatly increased by concentrating managerial attention solely upon those executive matters which are variations from routine, plan, or standard."² If standards are properly set up and administered, the major executives will have sufficient time to devote to constructive planning for the business, to the study of its strong and weak points, and to ways and means to keep it abreast with competitors and other businesses. The leaders in business today

¹ See Chapter XII. Also article by E. F. Rauss, *Manufacturing Industries*, February, 1927.

² L. P. Alford, *Laws of Manufacturing Management*, p. 14.

and Operating Ratios, and by rating representative securities of the concerns studied. The analyses of private agencies make these conclusions more certain. The information which the public has been able to secure from published records during the past twenty years is greater than it was for any previous period of time. From this it seems to appear that the flow of capital from one industry to another is not controlled by competition to the extent that many writers have supposed it to be controlled.

are those who have learned the usefulness of the principle of exceptions and have been able to utilize it. The idea of standards in costs, and other phases of business, seeks to use this principle of exceptions, in the highest degree, for administrative and management control. It enables specialization in management to be more effective than it has ever been before because greater control of results are possible.

The use of standard costs makes practicable the use of a principle of proportion; namely, that of units and prices. If the units are customarily stated in several measures, the operation of standard costs makes possible more easily the construction and operation of index numbers for the purpose of stating quantities. Where standards and results are stated in terms of units and prices, a great deal more information can be got from records and reports than when only one measure is employed. The great importance of the information which may be secured from such statements has not yet been recognized by business administrators, managers, and cost accountants. The use of units and prices in standards and in performance makes possible valuable comparisons between the two sets of measures. The variations between standard costs and performance costs set out in clear relief the exceptional cases that require consideration by the management. Of course, almost every performance will vary from standard. In practice, the variations may be classified in such a manner that certain types, percentages, classes, and amounts of variation may be called to the attention of designated executives. The variations may be analyzed in such manner that the causes for the variations may be ascertained. Such an analysis provides the executive with information upon which he may rely to place responsibility for failure to secure performance.

Standard costs rest rather firmly upon the principle of time. That is, from the viewpoint of control, time is a very important factor in standard costs. Every space of time is not of the same importance, as may be inferred from the principle of normal capacity. Time is, however, the third dimension; units and prices are the other dimensions. The importance of the principle of time, for the purpose of control, may be seen from a simple illustration. A certain machine has a practical capacity of thirty units per hour. At this rate the unit cost may be computed. The unit cost may also be computed for varying degrees of production. By means of such information the "score" in production may be computed every quarter of an hour, every hour, every day, or every week. Such information furnishes the proper executives with a powerful means of control, and it furnishes

the organization with a stimulæ, the utility of which is not generally recognized. Obstacles to production are removed and responsibility may be placed immediately for non-conformance to standards.

Another important principle of standard cost, which is closely allied to time, is that of progress—progress of work through the factory, progress in selling, and other types of progress. This principle brings out a different phase of the principle of exceptions. Gantt's progress charts and his writings have done much to emphasize the necessity for accurate and timely information regarding the progress of work, plans, etc. When standard costs are properly utilized, the information secured will materially help in the control of costs and of activities.

Another principle of standard costs is that of making the standard cost records an integral part of the general accounting system. Some writers advocate keeping standard costs by statistical methods. Such methods may seem to simplify the procedure greatly. Just as simple methods, it appears, are possible, which provide the essentials of a properly coordinated accounting system. The propriety of a control of cost figures by the general books of account has long been recognized as fundamental to a reliable cost system. The ways and means for securing this, in a particular case, may or may not be best suited to the particular purpose. Standard costs permit of much simpler methods of accomplishing the "tie-in" than the retrospective type of cost accounting.

Standard costs provide simple methods for inventory purposes. The inventory may be valued at standard costs and be as conservative a valuation as if valued at the lower of cost or market. The inventory should be taken at standard costs and if any revisions seem necessary to conform to a particular concept of valuation, an adjustment of the general ledger, or the work papers, may be made without disturbing the standard cost figures.

Standard costs, in order to be most effective, must be based upon precise management, time study, standard conditions, and control of operations. Without precise management—management which is guided by the science of management—the establishment of a cost standard will be of little use because the management will not make the proper use of the information. Without time study, and all the related studies—such as motion study, time analysis, etc.—the establishment of costs which are called "standard" will not result in effective standard costs. Time study would be absurd without the establishment of standard conditions under which the work is to be

performed. The last requisite to effective standard costs is that of the control of operations. This means that, standards having been set, the management will keep informed continuously as to the progress of the work, and any unfavorable performance will have immediate executive action.

Some other principles may be referred to briefly: (1) no charge may be made to the accounts of a department which does not have control of the item. A report which makes a distribution to the several departments may appear in reports to the chief executive, but not to the minor executives; (2) overhead costs may not be distributed so as to lose identity; that is, on the "wheel within a wheel basis"; (3) the item of cost—labor, materials, and overhead costs—must be kept separated; this makes easy a revision of standard costs when desired; (4) standard costs provide for a reliable statement of the unit cost of goods or services; (5) economic lot sizes are more easily determined; (6) wastes of such a nature as to require executive action should be segregated in special accounts and may or may not be chargeable to overhead or to costs, depending upon the nature of the waste. This subject is too broad to receive further discussion here. Other principles that apply to standard costs appear at other places in this treatise.

Illustration of Some Standard Cost Principles.—The procedure for putting standard costs into operation is very important, when the principles of standard costs have been accepted as correct.¹ As would be expected, there is no standard system to be used in making installations.² If the question of principle be kept in mind, the means and ways of securing standard costs can be secured best from an adequate and intelligent study of the particular business.

The illustration given below is not intended to be more than suggestive of some of the basic principles of standard costs. At several points in this treatise illustrations can be found of the ways and means for securing, for presenting, and for interpreting standard costs. In the illustration given below, no reference is made to the handling of scrap materials, breakage, and many other details. The development of ways and means for handling a considerable number of the details

¹ See G. Charter Harrison's classification of causes for variation in his *Cost Accounting to Aid Production*, pp. 15 and 207.

² Some ways and means of securing standard costs may be found in the following references: N. A. C. A. Bulletin, Vol. VIII, No. 12; G. A. Prochazka, Jr., in series of articles in *Industrial Management* beginning in January, 1927; E. F. Roberts, *Factory*, October, 1924, et al.; G. C. Harrison, *Ibid.*

connected with standard costs is beyond the scope of the present treatise.¹

The principal ways and means of standard costs are stated in the form of journal entries, as follows:

General Ledger Control Accounts.

Direct Labor (Note 4)

(1)

Dr. Pay roll.	\$10,000	
Cr. Accrued wages, cash.		\$10,000
To charge pay roll when due, with credit to proper account. *		

(2)

Dr. Labor in process.	\$10,000	
Cr. Pay roll.		\$10,000
The labor in process may be distributed according to departments, production centers, processes, or articles, according to requirements for the desired accounting. (See Note 1.)		

(3)

Dr. Standard labor in process.	\$9,000	
Dr. Variations in standard labor in process.	2,000	
Cr. Labor in process.		\$10,000
Cr. Variations in standard labor in process.		1,000
Subdivided as in item 2.		

(4)

Dr. Finished stores at standard labor cost.	\$6,000	
Cr. Standard labor in process.		\$6,000
The stores' accounts should be subdivided as desired, and the standard labor in process classified as in item 2 and 3. The finished stores are carried at standard labor costs.		

At the end of the month, the following entry should be made on the books or work papers:

(5)

Dr. Reserve for variations in standard labor.	\$1,000	
Cr. Variations in standard labor in process.		\$1,000
(Note 3)		

The standard labor cost of the labor in process, in this simple case, would be \$3,000. The accuracy of this valuation may be verified by an inventory of the goods or articles in process.

General Ledger Control Account.

Stores Accounting (Note 4)

(1)

Dr. Raw materials (at cost).	\$18,000	
Cr. Accounts payable cash.		\$18,000
Classified as desired.		

¹ For a technical discussion of other general features of standard costs, see the J. A. C. A. Yearbook, 1926.

(2)

Dr. Direct material in process (at standard)	\$12,000
Dr. Variations in direct labor in process from standard (Note 3)	300
Cr. Raw materials (at cost)	\$12,300
Classified as desired (Note 1).	

(3)

Dr. Indirect materials in process (at standard)	\$3,000
Dr. Variations in indirect materials in process from standard (Note 3)	100
Cr. Raw materials (at cost)	\$3,100
Classified if desired (Notes 1 and 2).	

(4)

Dr. Finished stores at standard material cost	\$12,500
Cr. Direct materials in process, at standard	\$10,000
Cr. Indirect materials in process, at standard	2,500
Classified as desired.	

The standard value of the direct materials in process is \$2,000, and the standard value of the indirect materials in process is \$500. This may be proved by an inventory.

Overhead Costs, Standard.

General Ledger Control Accounts.

(1)

Dr. Procurement overhead costs, actual	\$15,000
Dr. Marketing overhead costs, actual	12,000
Dr. Personnel overhead costs, actual	17,000
Cr. Accounts payable, reserves, cash, accruals	\$44,000
(Note 4)	

(2)

Dr. Procurement overhead cost in process, at standard	\$12,000
Dr. Personnel overhead cost in process, at standard	15,000
Cr. Procurement overhead costs, at standard	\$12,000
Cr. Personnel overhead costs, at standard	15,000
Charged into process on the basis of the standard cost of labor, materials or some other basis (Note 4)	

(3)

Dr. Finished stores	\$23,000
Cr. Procurement overhead costs in process, at standard	\$10,000
Cr. Personnel overhead costs in process, at standard	13,000
Subdivided as desired (Note 4)	

(4)

Dr. Marketing overhead costs, at standard	\$11,000
Cr. Standard marketing costs	\$11,000
(Note 4)	

¹In some cases it may be found advisable to have an account (or accounts) for Scheduled Materials in Process, at standard quantities and prices. The difference in value at standard and at cost may be carried to the proper variance account. As materials are drawn from stores, labor, and overhead incurred, the proper "schedule" account may be credited. In some cases this cost "schedule" account may serve as an "in-process" account for costs. In general, such an account may assist in the control of stores, labor, and overhead costs. The accounting system should be so devised that items entering into the various processes may be accounted for ac-

A control account should be kept in the general ledger for each principal class of the expense that is incurred in the carrying out of particular responsibilities. This information should be kept in such an analytical form that reports may be made therefrom at periodic intervals. The accounts should be kept in terms of the standards so as to make the variations between standard and actual cost easily analyzed. The detailed accounts necessary to be kept will depend largely upon the type and size of the individual organization.

Each of the accounts kept in terms of responsibility should be analyzed according to the nature of the particular items.² In charging overhead costs, due consideration must be given to the particular standard set for the period. If, for example, procurement overhead for a particular period is estimated at 200 per cent of the standard labor, the standard overhead is easily ascertained. The standard overhead may be composed of one hundred separate items. At periodic intervals the computation for the individual items may be made easily. Another advantage of standard cost, not yet fully recognized, is that different articles may bear different rates of standard overhead and profits for the several services, and yet remain simple in computation and in application.

Setting Standard Costs.—The technique and the ways and means for applying the principles of standard costs are important matters. Space does not permit, however, of more than a simple statement of the procedure. The several cost factors must be studied before reasonable standards can be determined. It is not necessary, however, to have accurate standards for all the factors to begin the installation. The subject may be approached from the viewpoint of the study of special cases. Standard costs may be used to control specific types of labor, material, or overhead costs. The work may start from the study of one particular commodity or operation that has possibilities of favorable results. The starting and stopping points are individual problems.

curately. This provides for a knowledge of the constituents or each assembly as items pass from one stage to another in manufacture.

² Occasionally some of the indirect materials may be charged directly to an "in-process" account at standard prices. A monthly or periodic inventory may be used as a basis for adjustment.

³ It may be that this item, from the viewpoint of "sound" accounting, should be closed to profit and loss. This, however, would not be in conformity with the concept of standard cost. The next period may show a credit, and over a cycle of years the variations may balance.

⁴ Subdivided according to major executive responsibility and further analyzed according to minor executive responsibility. The classification should also show the nature of the several items.

The data upon which the various components of standard costs are based should be built up by the analytical and the synthetical methods. The basic data should receive an adequate test as to their reliability. Interpretation of the facts will often be a matter of presenting the facts in a logical manner. In some cases, the interpretation of facts will be a matter of opinion. In such cases, the opinion should be based upon the available facts and the general concept of standard costs.

In some cases materials or other items vary to such an extent as to cause standard costs to be of no apparent value. Such difficulties may be obviated by the application of a simple index number to take care of the variable. For example, suppose that there are 100 pounds of raw material A in 1,000 of B articles. The raw materials, at the time the standard cost is set, may be worth, say, \$100. If, in the course of a month the price of this material rises, to, say, \$125 the index is $125/100 \times 100$ or 125. If it is feasible to set up some of the standard cost items in terms of a reasonably accurate budget the relatively stable items may be carried at standard cost and the other items carried by retrospective cost methods. The application of index numbers, or the addition or deduction of a percentage to bring former standards into agreement with current forecasts, is an important feature in revising the cost estimate for budget purposes. If the units and the prices or an index number of them are known, it is a simple matter to revise standard costs so as to reflect necessary changes in former standards.

The Control of Standard Costs.—Something of the nature of the means of control which standard costs provide has been indicated previously. For the purposes of a further development, the following four aspects of the question will be treated: (1) profits cost; (2) labor costs; (3) material costs; (4) overhead costs—and the variations from each of these.

Control of the standards for each of these factors may be secured by research work. The standard must be reasonable in the light of the methods available to accomplish the task. Faulty standards may permit many wastes to occur which better standards would prevent. Studies made for the purpose of establishing standard costs generally reveal many sources for the improvement of ways and means of doing work or of securing better results. The desire to secure better standards for the purpose of business control has set hundreds of highly qualified specialists to work to find the "one best way" and better ways

to do work. For example, Mr. A. B. Segur¹ has announced the following law of motion-time analysis and stated it in the following words: "Within practical limits, the time required for all experts to perform a true fundamental motion is constant." Gilbreth analyzed the fundamental motions and found that there were seventeen such motions. From motion-study he ascertained the "one best way" to do work. Before standards are set, an adequate analysis of the items involved will do much to control the standards.²

After the standards are set, control of results comes largely from a knowledge of the progress of the work as compared with the standards. The causes for variations from standards must be known promptly, if the information is to be used to control the "history" of the results. Timely information as to the causes for variation from standard costs is a prime requisite to executive control of a business enterprise. A knowledge of the causes for variation from standard cost is essential to the effective placement of responsibility for the results obtained.

The Nature of Quantity and Price Variations.—A general analysis of the variations from standard cost may be summarized as follows:

<i>Items</i>	<i>Quantity Variations</i>	<i>Price Variations</i>
Profits.....	Various	Various.
Labor.....	Efficiency in use of labor	Wage rate variation.
Material.....	Efficiency in use of material	Efficiency of purchases manager.
Overhead costs....	Management efficiency	Expense rates.

Some of these items require qualification or further explanation.

Variations in profits from expectations may be due to a variety of conditions. The responsibility for the variations may be assignable to external as well as internal conditions. Sufficient information may be obtained for the chief executive to secure a good picture of the causes for variations in the profits. The variations in the profits may be analyzed into a comparatively few fundamental causes for variation and the results used to correct the "log" of the business "gun."

Gantt did much to show the causes for variation in the efficiency of labor, machines, etc. The responsibility for labor variations may or may not be assignable to the workman. For best results, the causes for variation from standards should be placed immediately. Mr. M. R. Lott³ has described a simple method of doing this for labor costs.

¹ *Manufacturing Industries*, April, 1927.

² *Ibid.*, p. 272.

³ *Manufacturing Industries*, Vol. IX, No. 4, p. 348.

TABLE 22

CAUSES FOR DEVIATION FROM STANDARD TIME

<i>Symbol</i>	<i>Materials</i>
1	Defective castings—very hard.
2	Defective castings—blow holes.
3	Defective castings—excess stock.
4	Forgings—very hard.
5	Forgings—blow holes.
6	Forgings excess stock.
7	Defective castings due to pattern.
10	Required material not available.
11	Required material other than specified on blue-print.
12	Defective material supplied.
13	Required material available but wrong material supplied.
14	Material injured by distorting or defacing.
15	Material characteristics: varying degrees of hardness; quality of material; varying degrees of straightness, flatness and smoothness.
	<i>Tools</i>
20	Tools not available before job required by production department.
21	Tools not available at tool crib.
22	Defective tools supplied.
23	Tool broken down in operation.
	<i>Machines</i>
25	Proper machine not available, in use for another job.
26	Defective machine or equipment discovered defective after setting up.
27	Defective machine or equipment, broken down during operation.
	<i>Information</i>
30	Operation sheet not available, mislaid or carried away.
31	Operation sheet not available, made by methods department but not supplied by production department.
32	Blue-print mislaid or carried away.
33	Wrong information.
34	Insufficient information.
35	Fault of supervision.
	<i>Time Allowance</i>
36	Insufficient time allowed.
37	Time consumed less than time estimated.
38	Additional set-up, original order broken into smaller lot.
39	Machine set-up on previous lot.
	<i>Workman at Fault</i>
40	Operator not accustomed to this class of work.
41	Operator unable to meet time, due to physical condition.
42	Operator did not make an honest effort.
43	Inexperienced operator.
44	Previous operation at fault.
	<i>Inspection</i>
46	Waiting for inspection.
47	Defective inspection on previous operation.
	<i>Development</i>
51	Experimenting with factory methods.

See Table 22. The method consists essentially of using a form on which is printed some fifty-one specific causes for variation. This obviates the necessity of general inferences as to causes for variation in labor and helps to place responsibility for the failure to achieve standard results.

The wage payment plan will have much to do with the variations in wastes. If a 100 per cent bonus is paid, the only variations in wages will occur when the workman fails to attain standard time.¹ If piece rates are in effect, no variation in labor prices will occur, but in each of these cases the results may cause variations in the overhead costs.

Variations in the quantity of material used may be analyzed for defective standards and several classes of wastes. The results may be used to correct the standard allowance for waste, or to secure more effective utilization of materials. The variations in the price of material purchased from the standard price of material may be used to judge the efficiency of the purchasing agent. To get a technically correct measure, if one is desired, the standard price of materials should be carefully forecast by the purchasing agent. His efficiency may then be based upon the accuracy with which he can forecast results.

The variations in overhead costs may be classified into a variety of variations but should be summarized according to executive "responsibility." The summary classification may be divided into variations in the various major executive groups as shown by the internal organization chart.² This procedure is illustrated at other points in this treatise.

Causes for Variations from Standard.—The causes of variations from standard should be analyzed into time variations as well as unit and price variations, wherever this is desirable. There are a number of ways by which variations in profits, labor, materials, and overhead costs can be analyzed and classified. The nature of the variations in each business will depend to a considerable extent upon the individual problems. A further analysis of the variations may take place along the following lines:

Variations in profits:

Due to the net effect of the combined variations, including sales, etc.

¹ See series of articles by R. W. Darnell in *Management and Administration*, 1923-1924.

² Mr. E. F. Rauss, in *Manufacturing Industries*, February, 1927, p. 93, gives an illustration of how this is done by the Cadillac Motor Company.

Variations in labor:¹

Due to hours worked.

Due to rates of pay.

Variations in material:

Due to quantity of material used.

Due to quality of material used.

Due to price.

Variations in overhead costs:

Due to variations in quantity of services used.

Due to quality of services used.

Due to price of services used.

Due to variation in operations from standard, caused by variations in time.

Due to miscellaneous expenses, too small to justify accurate analysis.

Variations which may affect each of the above classes of variations:

Due to use of alternative standard.

Due to revision of standard.

Interpretation of Variations.—Standard costs, as stated previously are based upon estimates of the activities of the concern over a period of years.² For management purposes, this period of years is broken up into segments—hourly, daily, weekly, monthly, or quarterly periods—according to requirements. The basis for management rests upon the future, but in many instances, the plans for definite operation do not extend into the future for more than a relatively short period. Standard costs help materially in formulating this basis for action—the budget. Since standard cost is based upon a forecast of operations, it is easy to see that performance will vary from the forecast.

The various control accounts for standard and for performance cost will give the summary variations from standard. The variations for each class of items may be analyzed so as to show the causes for variation. In making this analysis, due consideration must be given to (1) clerical errors,³ (2) interpolation to ascertain what “should

¹ The data given in Table 22 show how these variations may be classified so as to place responsibility for failure or to give credit for success in performance. A somewhat similar analysis should be made, as the particular problem may require, for material and overhead costs.

² The main features of this technique will be found in the two following chapters. It should be emphasized, however, that standards are bases for judging performance, and that they must be reasonable for future attainment and interpretation.

³ Emphasized by H. W. Maynard in N. A. C. A. Bulletin, Vol. VIII, No. 2, p. 561.

have been" normal under the conditions faced, and (3) ascertainment of the basic causes for variation. One of the advantages of standard cost is that clerical errors "cannot" be allowed to spoil the information furnished by reliable costs. The first analysis should eliminate the clerical errors. A second analysis should be made for the purpose of revising the standard in the light of activity of the concern. This may be done by means of a simple formula which recognizes the fixed and the variable overhead costs, as explained in Chapter XII. The remaining variations serve as a basis for judging the effectiveness of the management. The basic causes for variations in the operations of the various major and minor activities of the business may be judged from the nature of these variations. If the variations can be accounted for in terms of units and prices, the problem of interpreting the variations will be less difficult and of more utility. In Chapters V and VI something of the nature and interpretation of variations in costs was illustrated. Other illustrations appear in subsequent chapters.

If the standards are set up and kept in terms of the particular organization, the variations between standard cost and attainment cost will be of considerable value in placing responsibility for success or for failure in performance. The placement of responsibility, as currently practiced, is often ineffective because not enough reliable data are available to show the nature of the causes for failure in performance. A well-devised and well-operated standard cost procedure should analyze significant variations in cost so as to show the effective cause for failure in performance. This may be done by the application of the principles and the procedure developed herein.

CHAPTER XII

THE BUDGET AS AN AID TO MANAGEMENT

Development of Budget Ideas.—Two decades ago the literature in this country on budgeting was confined almost entirely to governmental bodies. A decade ago budgeting for business enterprises began to attract and to hold the attention of business executives. About the time the idea got well started, some business executives came forward with the information that they had been using the budget with success for anywhere from three to thirty years. The growth in the budget idea has indicated that the subject has undergone refinements in concept and methods.

It appears that budget ideas have grown along the following overlapping lines:

- (1) The idea of planning the operations of a business in one's mind developed first. The plans were formed largely from analyses made from accounting records and an intimate knowledge of the business. The written plans, if any, were largely informal.
- (2) The idea of expressing the business plans in formal written statements developed later. The statements were used for the purpose of showing manufacturing, sales, expense, and finance requirements. The ideas were then united by means of "master schedules."
- (3) The idea of securing the cooperation of the executives and certain employees for the purpose of getting a better idea of what the business "should do" during a future period is a more recent development. The information from these various sources would then be tabulated and set up as a plan for action. That is, a coordinated plan was made for the whole business. This idea has grown until it has become known as "budgetary control."¹
- (4) The idea of "budgeting to the business cycle"² soon made

¹ J. O. McKinsey, *Budgetary Control*, p. 1.

² J. H. Barber, *Budgeting to the Business Cycle*.

itself felt because of a growing interest in the "business cycle,"¹ the statistical method, and scientific research.

Thus the ideas on budgeting have been developed from loosely connected and poorly formulated plans, through the stages of systematism, to a stage where the application of the scientific method is employed to give the business greater control of its destiny.

The Budget Defined.—Like other subjects, different writers define budgeting in such a manner that it conforms to their ideas on the subject. If the aim of the budget is proportional to its potentiality, its definition should be broad. Budgeting may be defined as that branch of accounting which deals with the science and the art of forecasting future operations. It uses the various tools of accounting to forecast what "should be" and what "will be." It perfects its ways and its means by an evaluation of the effective causes which contribute to variations between what is predicted and what happens.

A number of definitions have been given to budgeting. Hilgert says: "Budgetary control may be defined as accounting in terms of the future. It means a careful planning of all functions in advance."² McKinsey says: "Budgetary control . . . (is) that which deals with the coordination of the operations of the several departments to the end that a well-formulated program may be made, for the business as a whole."³ He also recognizes forecasting for the business cycle as necessary, if "proper results are to be obtained." Barber says: "Budget methods aim at sound 'anticipation of consequences' that will merit executive 'provision against them.'"⁴ Many other definitions may be secured from published works. As the budget is now defined and used, it is necessary to know just what procedure has been set up in each individual business before one can appreciate the type of budget that is used. Such a variety of ideas about budgets has many disadvantages, but it has one great advantage: the quality of adaptability. For best results, however, the budget should be provided with ways and means which will enable it to accomplish its highest purposes.

Purposes of the Budget.—The budget has several important purposes. Some of these are as follows:

- I. It serves as an administrative and management tool for the control of the profits of an enterprise, or an industry.

¹ W. C. Mitchell, *The Business Cycle*.

² J. R. Hilgert, *Cost Accounting for Sales*, 1926, p. 32.

³ *Ibid.*, p. 3.

⁴ *Ibid.*, p. 3.

- II. It serves as an administrative and management tool for the control of the financial position of a business, or for an industry.
- III. It serves as a tool for the control of employment and wages.
- IV. It may serve as a tool for the regulation of business in accordance with the principle of fair prices and fair profits.

Each of these purposes of the budget will be discussed briefly.

A Tool for Profits Control.—In many industries and businesses today there is possibly no more important question than fair prices and fair profits, as indicated in Chapter X. Whatever be one's ideas of how best to secure this, or other aims, is not a factor that affects the usefulness of the budget in accomplishing the tasks set for the budget. The budget is an important instrument for emphasizing the aims of the business—profits—and the ways and the means for securing those aims. In many businesses and industries today, so much stress is laid upon "service," "expansion," "competition," and other uneconomical indulgencies, if excessive, that sight is often lost of the first aim of private business—that of adequate profits at reasonable prices. The budget may serve to bring these aims to the attention of administrators and executives in a forceful way. Since a little over 50 per cent of the 250,000 odd business corporations in the United States do not earn any profit,¹ and only about 5 per cent of them know the cost of their services,² it seems that more thought devoted to proper budgeting would be profitable.

Budgeting helps executives to visualize the profits problem in the business and in the industry or trade. To insure an adequate profit for the business the several functions of the business must be planned properly. The "merchandise plan" should provide plans for the sale of definite goods or services, at fair prices, which can be procured at a standard cost, and which can be marketed at a cost that will allow for a fair profit after the necessary expenses are met. To accomplish this, it sets definite standards for each major and minor function of the business. This serves to emphasize the importance of more stable procurement and its major component—labor. It emphasizes the importance of standardized and simplified goods, the more economical marketing and production of goods, and the elimination of wasteful

¹ U. S. Census, 1923. For an account of losses see "Taking the Risk," by Foster and Catchings, *Nation's Business*, July, 1925. See also Statistics of Income, Treasury Department.

² Estimated in several publications of the N. A. C. A.

and uneconomical practices. The budget may serve as an effective method for fixing authority and responsibility for action. It may serve to indicate what "should be" accomplished during a given time. An interpretation of the causes for variation between the budget and performance may be used as a measure of the ability of the management to serve the best interests of the stockholders, the employees, and the general public.

A Tool for the Control of Finance.—The budget may serve as a useful administrative tool for the control of the business enterprise. Wisely used, it may serve as an aid for the stabilization of the finances of a business, an industry, or the business activities of a community. Financial stability depends, in the final analysis, upon the proper flow of adequate profits for the net worth of the business. There are also other very vital factors; namely, proper legal and police protection, competent management, competent personnel, the size and type of the business, etc. The final question, however, is an adequate return upon the investment. The emphasis on profits may be placed first or last. The psychology of placing profits first may be objectionable to many and especially to certain consumers. To place the emphasis on the "last" share for profits may be good psychology to use on consumers, but it is bad as business psychology because it too often neglects the final share. Proper budgeting serves to emphasize a fair profit first and in doing this it gives a sobering effect to business planning.

Writers on budgeting have stressed the point of view of the individual enterprise. Nothing has been said, apparently, about the effects of proper budgeting upon the financial stability of an industry or a community. This subject may be considered from two points of view; namely, the private, and the public points of view. When some business enterprises in a particular trade or industry pass that crude state of "small concerns" and branch out into "big business," an entirely different situation faces the industry from that which faced it previously. Under the "free competition" idea the "survival of the fittest" are the only ones that are competent to serve the public. Our experiences with this idea have not been satisfactory. The ethical concept back of the idea does not meet with present ideas that are quite common in the community.

A budget for an industry would do much to solve the evils that beset the "man industries" and the community. Considerable effort has been put forth to control certain business factors that enter into the budgets of the several producers in certain industries, but little, if

anything, has been done to budget the several industries. Individual firms budget with the expectation of securing a certain amount of the business. Such budgeting may lead to even worse competition than before. From the viewpoint of the industry as a whole, the stern reality of facts, such as might be disclosed by a well-drawn combined budget of the concerns in an industry, could do much to secure the financial stability of the individual firms as well as for the industry as a whole. From the public point of view, such a budget would be beneficial. It would stop the wastes of prodigality, which, for example, is now taking place in the oil industry. This same evil affects many industries but not upon so obvious a scale. The public might easily be assured of and receive better prices and services than it will receive without such control. The small investor would be protected better and the savings invested in the industry would be allowed to earn a fair return instead of high returns, large losses, or no return at all, as is now so often the case.

From the viewpoint of the individual enterprise, the budget is, if formulated wisely, a powerful tool for securing financial control of an enterprise. It indicates what the trends in the business are, and if the administrators use the information in an intelligent manner the enterprise is protected from many of the hazards in business. Some of these hazards will be discussed briefly.

In a growing business, care must be exercised in the control of fixed property. To keep from overexpanding, the Dennison Manufacturing Company restricts its growth to about eight per cent per year. If the plant and equipment is allowed to expand beyond the needs of the business, grave consequences may result. Uneconomical expansion is a frequent cause of bankruptcy. The budget, if drawn up properly, will not make the mistake of providing facilities which are beyond the requirements of the business. In a declining industry, the budget may greatly assist in the selection of a new line of products. In such a case, the research necessary for the setting up of reasonable estimates of operation will be money well expended, if the researches are wisely conducted.

The budget emphasizes the time when a particular program will probably require additional assets. This should enable the treasurer or the controller to secure the necessary funds on favorable terms. This phase of the budget was explained in Chapter VIII.

A Tool for the Control of Employment.—The industrial revolution and the rise of great industries and big businesses has brought

with it perplexing labor questions. The wastes which take place in business due to unemployment and to the strife between the workers and the managers of enterprises has never been estimated. The amount is enormous! The value of the budget, for individual enterprises and for industries, has not been sufficiently recognized as a very fundamental way of attacking this great problem.

Unemployment is indeed a great problem. There are many phases to it. Some of the phases may be successfully attacked by the proper administration of the budget. Seasonal and cyclical unemployment may be greatly reduced if not almost entirely eliminated by it. Unemployment caused by overexpansion and overproduction in business may be considerably reduced by budgets. Furthermore, accounting, in its broadest meaning, may be used as a powerful instrument to solve some of the questions relative to wages, output, hours, etc. These questions will receive attention later.

A Tool for Legal Regulation.—In civilized countries business is usually subjected to different types of legal control. Such control usually arises as a consequence of certain practices of long standing that have resulted in exorbitant profits being made by some individuals at the expense of the public. Once a given type of control gets started, it is often a difficult task to change it, no matter how little it is enforced or capable of being enforced. Time and conditions, however, work many changes. Our legal regulations of many businesses is antiquated, as pointed out in Chapter IX. If business is to be controlled by legal procedure which recognizes the principle of fair prices and fair profits, accounting should be a powerful tool by means of which an effective procedure might be secured for the necessary control of the enterprise. In the absence of such a concept of legal control, individual industries and the public can enjoy only a portion of the benefits that they might receive from such control. Some of the advantages that such a plan of operation would insure are now being secured in an informal way, such as by the free interchange of information among businesses, associations, and societies. It seems that these avenues hold much more of value to business than is being received from them. The future will very likely hold more of value and more realizations of the possibilities they offer than has the past.

The Budget as a Means for Control.—Much emphasis has been placed upon the budget as an instrument for executive control. This means that the budget is an instrument through which the authority and the responsibility in the organization may be traced. The adminis-

trative and executive control of a business must take place in advance of operations. Budget control means that there is a careful planning in advance of operation. These plans should be so laid that performance may be checked against the plans or standards.

The chief means of control of the results of a business are to be found in the fact that by knowing what will likely be the results under two or more standards of operation, the results may be affected. That is, the business may be so operated that its financial condition may be determined for periods far enough in advance to guard against blunders that may threaten its solvency, etc. It centralizes in the board of directors and in the chief executive the means by which to act in such manner that they may direct the operations of the business.

The Budget as a Basis for Judging Efficiency.—Since the budget may serve as an effective way of placing authority and responsibility in the business, it should also serve as a basis for judging efficiency. The chief executive should have an effective way of ascertaining whether or not the various major and minor executives and the employees are performing their work in an acceptable manner. If the budget is constructed properly it may be used as an instrument to check the efficiency of the several members of business. Accounting tools are not automatic, in many respects, in performing this function. The results must be interpreted. Other accounting tools may assist greatly in the proper interpretation. How this may be done in specific cases will be explained later.

The directors may judge the efficiency of the chief executive by adequate accounting. The causes for the variations between the budget and the performance, if properly interpreted, serve as a basis for making this calculation. The value of such an instrument has not as yet been recognized, apparently. If the budget has been set up properly, its directors have every reason to judge the chief executive, in a large measure, by his ability to secure the desired results, or show fundamental causes why the results were not secured. Executives should be employed for the purpose of controlling the results that are within their control. The directors have a right to expect this from the chief executive down through the organization.

Organization and Policies.—Two of the most important principles of the budget relate to the internal organization and to the policies of an enterprise. They are prime requisites to the operation of a well-formulated budget. The importance of proper organization and

policies was indicated previously. The treatment here relates strictly to the budget.

If the budget is to serve as a reliable instrument for the control of a business, proper care must be exercised in the construction of the instrument and in keeping it in good order. The broad policies of a concern affect the type of organization considerably. The policies of the concern should be clearly stated in writing. Its history should be written with clearly defined major policies as its base. The organization should be built to carry out effectively the policies of the business. Since the policies of a concern find a large measure of expression in the budget, it follows that the organization must be morally responsible for its actions in carrying out the budget. This moral responsibility should be capable of an effective expression by accounting methods. The principles of organization and of policy control in the budget are closely interrelated to the principles of administrative and management control as set forth in Part II.

The marketing, procurement, labor, and financial policies are all interdependent. This should be recognized clearly in setting up a budget procedure. The finances of a concern may be such that full advantage cannot be taken of the most favorable conditions. The state of the market may be such that the favorable advantages in other fields cannot be taken advantage of properly. The product may be so poorly adapted to the wishes of customers that it cannot be sold at a profit. In like manner, every phase of the business may be dependent on the other phases of the business. The preparation of plans for and the operation of a budget procedure must clearly recognize and be capable of giving expression to the probable strength of the "weakest link in the chain."

Budget Procedure.—The procedure which should be set up for formulating the budget, in any individual case, will depend largely upon the specific objects which are in view. Great refinement of procedure may not yield any better results, in a given case, than simpler, yet adequate methods. The need for greater and greater refinement of methods will usually follow with increased use and reliance upon the budget, as the chief instrument of control in an extensive business. The principles which are followed in this treatise apply to a sizable concern and along broad functional lines. The various parts of the budget are treated in greater detail in the remaining parts of this book. The principles of budgeting and the analysis of the complete or master budget are treated in the present chapter.

The complete plans for the operation of a business, such as a board of directors or a chief executive needs, may be called a master budget. A master budget should be composed of a number of major budgets which are in terms of the organization. The particular method of going about getting the major and minor budgets is, in many respects, an important matter. The wrong methods may mean failure in a given case, as so much depends upon the type of organization and the personalities which compose the management of a particular business. The best procedure for determining the several budgets in a well-organized business seems to be somewhat as follows:

1. Estimates should be secured from the minor departments of the business covering the operations for a specific period in advance.
2. The minor budgets should be used as the basis for major budgets. The major executives should, however, use their own judgment in making their estimates.
3. The budget officer should make a preliminary master budget from the major budgets.
4. A statistical forecast for a specific period should be made by the statistical officer.
5. The budget officer should study the forecast in comparison to the preliminary master budget.
6. The controller as a chairman of the budget committee should assist the committee in harmonizing the budget.
7. The controller should present the tentative budget to the chief executive.
8. The chief executive should present the tentative budget to the board of directors, who pass upon it.

This analysis has taken many things for granted, so that further elaboration seems necessary.

The Minor Tentative Budgets.—In securing the minor budgets some technique is quite vital. Those who make these minor budgets should have a good knowledge of the past operations of the business and how any new policies or conditions may affect their estimates. They should be properly instructed as to the exact manner in which their estimates are to be presented. In most cases both personal and written instructions will be necessary. The way in which the idea is presented and the ease with which it can be prepared will have considerable to do with the attitude of the minor and major executives

of the business toward the budget and its successful operation. A few well-devised forms may assist greatly in getting the budget drawn up properly. Wherever possible, a standardized form should be furnished on which is presented, in parallel columns, the accomplishments of certain prior periods, in units and prices for the several commodities, and proper space for the estimate, which should also be in units and prices. The necessity for obtaining the estimates in units and prices for the operation of a fundamentally sound budget will be explained later.¹

An estimate that is presented by a minor or major executive which is not fundamentally sound is worse than useless. It may lead to large losses.

The Major Tentative Budgets.—The major tentative budgets should be prepared after giving due consideration to the minor tentative budgets. The major executives should be able to give a better estimate of future operations than minor executives. The experience of the minor executives and their estimates are of vital importance, in many lines of business, to major executives in making sound estimates of future operations. The major executive should have a better idea of the probable operations of his department than those under his direction. If the minor budgets are assembled properly, however, much detailed information can be gotten that may be exceedingly useful.

The Tentative Master Budget.—The minor budgets are combined into major budgets and these in turn are combined into a tentative master budget. One of the duties of the budget officer is to assemble the major budgets and to study and review them with the controller and other major executives. This work is performed to get a clearer idea of the work as a whole. It is strictly preliminary work, but if done properly it may be of considerable use in arriving at the final estimates.

The Statistical Forecast.—A reliable test for the tentative budget estimate is to be found in the statistical forecast. This forecast is the product of the scientific analysis of business facts. It is based upon the statistical method and should make use of such pertinent data as a skilled technician can secure from a well-informed controller's department and the necessary external information. The statistical forecast should predict the course of the business cycle and the statistician should know how each phase of the cycle will likely affect the several parts of the business. From a knowledge of past and prospective

¹ Chapters XXIV to XXXII.

conditions in the particular business the statistician can forecast each major budget, as explained in Chapters XXII-XXXII.

Preliminary Budget and Forecast Comparison.—The budget officer should make a study of the preliminary estimate and the statistical preliminary forecast. The differences between the two should be accounted for as far as possible. The budget officer should advise with the forecaster and the executives who prepare the major budgets for the purpose of bringing the two together. If this cannot be done in a satisfactory manner, the controller, as chairman of the budget committee, may undertake to harmonize the estimates. Whether or not this is done successfully is not a cause for very great concern.

Executive Approval of the Budget.—The controller and the budget officer, in conference with the chief executive (and the budget committee, if considered necessary because of prior non-agreement or otherwise), should present the proposed budget to the chief executive for his revision and approval. As indicated previously, the chief executive exercises control over the business largely by accounting methods. The budget as an instrument of control should be his measuring stick for the coordinating of business activities and for judging its achievement. From this, it follows that the chief executive is the official who should appraise the proposed budget and its several parts. The budget work that has been done up to this point is for the purpose of assisting the chief executive to appraise the proposed results. Mr. Coonley¹ has given an interesting account of an experience with his budget that may be used to illustrate the principle stated above. He says:

When the head of my planning and statistical department came to me in the early part of this year with the second annual estimate of our profits, he showed such a small black figure that it sent the shivers down my spine. I want to confess to being a rank optimist at all times, and it is terribly hard for me to see anything bad coming from any person or from any condition. Therefore, I need some one, not a rank pessimist but, perhaps, a rank practicalist, hanging to my coat tails.

My first inclination was to throw overboard his conclusions by saying that they could not be right. My second one was to say, "Look here, this fellow never before has gone wrong; why should he now?" And so I said, "If his prediction is true, or anywhere near true, something must be done about it." So I called in my chief accountant and my assistant, my treasurer and this man who had waved the red flag at me, and we sat down to the most serious "knitting" that I have indulged in since the year 1921.

¹ Howard Coonley, president, Walworth Manufacturing Company, N. A. C. A. Yearbook, 1926, p. 37. Also *Factory*, October, 1926, p. 591.

The Directors' Approval of the Budget.—From the principles of organization discussed previously, the directors are, in the last analysis, the ones that set the goal for the business. The budget which is presented to the directors may be revised before it is approved by them. If the results which are forecast do not meet with their approval, they must be revised and the proper administrative and executive action provided to secure the desired results.

When the directors approve the budget the tentative budgets should be brought into agreement with it. The chief executive and each major and minor executive then have their goals. Executive action should be provided in order to carry out the budget.

Special Qualifications.—In some lines of business the major executives may be better able to prepare the estimates without going to the trouble of getting minor executives' estimates. In other businesses the budget officer, the statistician, the controller, and the chief executive may be able to do the forecasting better without the labor of getting minor executives' ideas about the matter. This may be true of specialized products and in businesses where research methods may disclose a better method of predicting than those with which the minor executives are familiar. In many cases, however, such as where a large variety of products are handled that may not be classified satisfactorily, or where the proper procedure may not be perfected, or where the information may be otherwise beneficial, it is advisable to follow the procedure indicated above. The exact procedure to be followed by a concern at any given time will depend upon a number of practical considerations. Where the procedure varies from the principles outlined herein, a corresponding change should be made in the interpretation of the data obtained.

Conformance to the Budget.—It should be understood clearly that the budget is a guide and not a dictator. It is desirable that the budget should be as accurate as practicable and every reasonable effort should be exerted to make it dependable. If the budget is made on a monthly basis, it is not advisable to disturb the budget that is made out as a basis for operation during that period. Any fundamental changes should, however, be set forth as additions to or as deductions from the budget. This will help materially in revising the inter-department budgets and in taking the necessary executive action to profit from the additional information. It will also help in interpreting the variations from the authorized budget for operation.

If the budgets are to be effective as a means for executive control a suitable procedure should be made for the purpose of keeping the performance in proper relationship to the estimate. One way of doing this is to require a requisition which must be authorized by the controller or the budget officer before certain budgets may be exceeded. Another way is to hold the executive accountable for exceeding certain budgets. These variations will show up in the analysis of causes for variation. An appraisal of these variations may be more effective, in some cases, in placing responsibility and in getting results than can be secured by the first method. What is desired is intelligent executive action. The requisition method, if not abused, has many good qualities and may be more effectively used than the second method.

Procedure for Recording the Budget.—In general, the budget should not be recorded in the books that are kept for recording accomplishment. Where standard costs are kept, however, a considerable amount of the budget information should appear in the books of account. The major budget and the phases of the minor budgets not relating to standard cost may be kept more effectively by means of work-papers and by reports. If ledger accounts are allowed to collect regular budget information, they will become unwieldy and require much analytical work before a simple trial balance has any meaning. The ledger is usually put to a heavy task if it keeps a proper analysis of accomplishments. If the ledger can present an adequate analysis of accomplishment in terms of the budget, then the periodic work-papers can be prepared easily and the necessary reports rendered therefrom.

The Analysis of Variations.—The importance of a proper analysis of variations between the budget and accomplishment has already been stressed. Some advocates of the budget consider the analysis of variations between the budget and performance of no considerable importance. It should be emphasized, however, that administrators and managers who expect to perfect the budget instrument should be impressed with the importance of knowing the causes for significant variations. The budget instrument should be so perfected that it can be used to "hit the bull's eye."

One of the benefits that comes from the application of the scientific method to the solution of business problems is that the exceptional cases are isolated for the purposes of further analysis and study. This method isolates the good and the bad experiences and makes it possible

for the business to profit most from its experiences. The bad experiences may be eliminated gradually and the good experiences put to a larger use. One of the greatest sources for the collection of data to be recorded in the *Experience Book*, previously referred to,¹ is to be found in the analysis of variations. The accounting plan should be so constructed that the variations will be apparent and their causes easily ascertained.

Flexible Budgets.—Another way by which budget performance may be judged is that of the flexible budget. Briefly, the procedure is to determine a fixed and a variable factor, and from a formula the conformance to a standard may be checked. The possibilities of flexible budgets as a means for executive and administrative control have not as yet been fully realized or recognized. The fixed and the variable factors may be determined by statistical methods, as explained in the two following chapters. The explanation of their use and interpretation will also be deferred.

¹ Chapter VI, p. 80-81.

CHAPTER XIII

ACCOUNTING STATISTICS AS AN AID TO MANAGEMENT

Importance of Accounting Statistics in Business.—For some time the managers of many well-organized businesses have recognized the importance of “statistical” data and have made them a function of accounting. It is humanly impossible to understand the internal workings of a sizable business from accounting statements unless such statements make use of more than one measure. Units cannot be understood usually without a knowledge of prices, or vice versa. The necessity for making this type of statistics a branch of accounting has been stated previously.¹ For convenience, this branch of accounting is referred to as “internal statistics.”

Internal and External Statistics.—From the viewpoint of the individual enterprise, there are two classes of business statistics; namely, internal and external statistics. Internal statistics have to do with the statistical analysis of facts within the business and the interpretation of these facts. It also has to do with forecasting or prophesying what will happen in the future. In business parlance, some of the internal phases of statistics are known as: financial, cost, sales, production, expense, and other kinds of statistics.

The experience of business enterprises indicate, however, that conditions outside of the enterprise also effect internal conditions. This external phase of statistics is external statistics, because it is outside of the individual enterprise. In some well-organized businesses, however, the external phase of statistics is also a phase of the accounting function. They are closely interdependent problems, and for proper control they are used to aid the accounting function.

The Business Cycle.—Varying business conditions have been recognized by business men for years. Just how long, nobody seems to know. Economists for more than a century have been “theorizing” about the causes for alternating periods of prosperity and hard times. We now call these business phenomena the business cycle after Pro-

¹ Chapter II.

fessor Mitchell.¹ During the past ten years much study has been made of the business cycle by the study of mass data by means of the statistical method. After all these mass data are analyzed and perfected, Professor Mitchell says:

We shall still know little about a matter of prime importance, that is, just how prosperity, crisis, depression and revival affects the inner workings of the business. . . . How much does a depression affect the collections of a business enterprise? How much does it reduce the working capital? . . . How are losses really met? Are the physical conditions of the plants allowed to run down in active times? . . . How long do cancellations of orders drop in depression when buying is from hand to mouth? How early in the revival do they begin to mount? When do they reach their peak and how high is it? . . . How do business men take the business cycle into account in formulating their plans?²

The study of the business cycle has caused considerable interest to be taken in ways and means for detecting the various phases of the cycle and in profiting by the information. It has been found that certain industries are affected by the business cycle in different degrees and at different times in the cycle. This emphasizes the importance of each business man knowing how and when his business is likely to be affected by changing business conditions.³

Budget Difficulties.—As indicated in the previous chapter, the business cycle and changing business conditions affect the budget forecast. If the budget is to be based on correct principles, due consideration must be given to the business cycle. This necessitates an estimate of how the forces at work outside of the business will affect the internal workings of the particular business enterprise.

Many business firms budget and plan the operations of their business with not more than a suggestion that external conditions may affect their plans. The potent business factors at work in the industry, the firm, and the community are not tested to see if they may throw light upon the changing business conditions that have turned pleasing prospective profits into serious losses. In modern business it is often necessary to make commitments for considerable periods in advance. Materials and labor must be used in manufacturing commodities to be sold during the next season. The foresight used in planning business operations is often responsible for the bulk of the profits that a business may make under the "free competition" system.

¹ Wesley C. Mitchell, *Business Cycles*, 1913, University of California Press.

² *Journal of Accountancy*, 35:161-167, 1923.

³ Joseph H. Barber, *Budgeting to the Business Cycle*, also articles in *Manufacturing Industries*, Vol. XI, No. 6, p. 417, et al.

Budgets that are not based on fundamental business factors may cause considerable loss in business, and for that reason it is important that the budget procedure include a forecast of business conditions.

One of the important purposes of the budget is to assist the management in eliminating the erratic movements from business, or in reducing them as much as possible. Such movements are responsible for a large loss to the community. The administrators and the managers of business enterprises are largely to blame for these erratic movements. The community is demanding of management that business be made more and more stable.¹ The intelligent preparation and use of the budget will do much to make more stability in business. One important difficulty is in getting management to realize the situation and to take the proper initiative in the matter.

The Study of Quantitative Data.—It has been demonstrated many times that the study of quantitative data is necessary for a reasonable understanding of the operations of a sizable business enterprise. If a concern produces and sells, say, a hundred different items, it would be a difficult task to get much information from the business reports unless the data were analyzed properly; that is, by the quantitative method. There are two important ways of studying quantitative data, as applied to general internal statistics, as follows: (1) the study of units, such as, pounds, barrels, bags, boxes, tons, articles, and other physical measures, and (2) the study of volume by price indexes. Each of these will be discussed briefly.

A common way of studying quantitative data is the use of physical volume. It is often a satisfactory way of studying internal statistics. Where a large variety of products are handled, they may be grouped into classes for the purpose of study and analysis. The study may be in units or in terms of an index number. These classes may be converted into an index number of physical volume.² Some large concerns do this because it greatly simplifies the study of the position of the business as a whole. The groupings should be made in such a manner that the individual items may be analyzed, where this is practicable.

In some cases the variety of products is so great, and for other reasons it is not practicable to secure physical units of measure for the products. In such a case an index of the physical volume may be

¹ For a fuller statement of the wastes in unemployment and proposed remedies, see H. Feldman, *The Regularization of Employment*.

² See F. C. Mills, *Statistical Methods*, Chs. VI and IX, and references therein.

prepared from a knowledge of prices. A very simple case may serve to make this idea clearer. If 600 articles are sold during a month for \$5 each, the sales amount to \$3,000. From a knowledge of either two factors, the third factor may be obtained. Thus an index of prices taken in conjunction with the amount gives a knowledge of quantities.

Profit Requirements.—As indicated in the two preceding chapters, the first question in business is that of a reasonable and adequate profit. In medium-sized and small businesses the law of profits does not seem to be recognized as clearly as it does in sizable and big businesses. Here the prime purposes for engaging in business are clearly recognized, if the business is wisely managed.

A clear knowledge of profit requirements is fundamental to a sound plan for business operations. These requirements may be stated as a percentage of the net worth or as a certain amount of money. The rate of return must be adequate to maintain proper credit for the concern. The rate of return is relative, so that a good knowledge must be had of the returns obtained by other concerns and other conditions, before it can be known whether or not the rate of return is above or below standard.

The stability of the business and the industry will have something to do with the rate of return required. Such questions should be decided after an adequate study of the several factors involved in each particular case. The concept of fairness of profits will also affect the rate of profit. From the viewpoint of free competition, the rate of profit may include an amount that could be used to expand the business and keep it abreast of the industry. The fair price concept would not include the provision of an amount to cover expansion, as such assets should come into the business from investors. After a consideration of the factors involved, the profit requirements may be stated in the light of the policies of the enterprise.

The Price Policy.—In establishing a forecasting program the profits standard is the first of a series of problems. The pricing policy of a business must consider the profits ideal and the volume expectancy. The volume of business, discussed below, is usually dependent upon prices to a considerable extent. If the profits and the volume of business are known, then prices may be established. These three factors are, however, dependent and more or less variables.

From the standpoint of fair prices, the pricing policy of a concern or industry should be based upon four items, as follows: (1) profits; (2) volume; (3) cost; (4) prices. The profits standard is not ab-

solute irrespective of volume, cost, and prices. Profits would vary with cost and volume, if prices were fixed. If profits were fixed, prices would vary with cost and volume. An intelligent research study should indicate the approximate value of these several factors under given conditions, and the price set so that the largest volume of goods that were consistent with fair profits could be placed in the hands of consumers.

Under free or under effective competition, the prices of commodities and the profits earned by business enterprises depend largely upon the intelligence used by the competitors in securing a profit. The pricing policy under such conditions lays emphasis upon the "economic return attainable."¹ This means that an attempt has been made to secure the highest return attainable on the investment. Due consideration is given to the several factors which are estimated to be to the best interest of the concern over a period of years. Under these conditions, the pricing policy of a concern may be to give the individual enterprise a high rate of return. Prices and profits will both fluctuate, but the idea is to control these fluctuations so as to attain a given end: the attainment of the highest profit attainable under the conditions of competition faced.

The Volume of Business.—The volume of business is usually measured in pecuniary units. The better practice is to express it in units, prices, and amounts. A statement of the volume of business may be quite misleading if it is stated in dollars. For this reason, internal statistics should furnish a knowledge of the physical volume of business.

In making intelligent forecasts for a business enterprise, a careful consideration must be given to the physical volume of business and the prices that are to be secured. The volume of business furnishes the concern with highly useful information. A knowledge of plant capacity and plant requirements, sales capacity and sales requirements is essential to prudent management. From a knowledge of the volume of business that may be secured at given prices, costs, and profits, the management is in a position to set up standards of attainment for specific periods in advance. If standards are set for profits, costs, volume, and prices, the concern has a goal toward which to work, and the variations from these standards may be checked and set in the right direction by executive action when required.

¹ Albert Bradley, "Setting Up a Forecasting Program," American Management Association, Annual Convention Series, No. 41, p. 6.

The Principles of Forecasting.—When ordinary business data, such as balance sheets and operating statements, are assembled and analyzed for the elements that affect a time series, it will be found that there are four significant factors at work upon the data. These factors are known as (1) the growth, (2) the seasonal fluctuations, (3) cyclical or general business conditions, and (4) random fluctuations.

The growth factor is clearly recognizable in many classes of data. For example, the population grows at such a rate that it may be forecasted with considerable accuracy.¹ The growth in the production of coal, petroleum, pig iron, and many other commodities has been recognized. The rate of growth in few industries is the same, and for that reason research is necessary to ascertain a healthy rate of growth. The growth factor may be eliminated from data by use of the statistical method.²

Seasonal fluctuations affect time series data and may be removed by the statistical method. For most purposes the random and the cyclical fluctuations are left in the time series. These fluctuations are shown as deviations from normal. From a knowledge of these deviations from normal for significant data, it has been found possible to apply the knowledge thus obtained to making forecasts that are very accurate.³

Since the principles of forecasting are based largely upon the statistical method, a brief statement will be made of some of the principal features of this method. The statistical method rests rather firmly upon the mathematics of probabilities. Mathematical formulæ are used to segregate certain of the data. Mass data can be studied and valuable information obtained. The data may be arranged in the form of a frequency curve. From this information the mean, the quartiles, and the standard deviation may be determined. The relationships, if any, between certain classes of data may be studied by the correlation method. For example, it may be desirable to know the relation between automobiles in use and gasoline consumption, or the relation between income and automobiles purchased, or other relationships.

Budget Forecasting.—A valuable refinement of budgeting, and a requisite to proper budgeting, is that of budget forecasting by the aid of the statistical method and a thorough knowledge of the internal

¹ See Jordan, D. F., *Business Forecasting*, Ch. I.

² See Mills, F. C., *Statistical Methods*, Ch. VII.

³ See, for example, J. H. Barber's articles in *Manufacturing Industries*, 1923-1927.

and external workings of the business.¹ Forecasting by the statistical method is an art, but most of the instruments used are usually subject to scientific checks. Something should be said about the scientific procedure before the art of budgeting is considered. The art necessary for scientific investigation, of course, precedes the science of budgeting, which precedes the art of budgeting.

The first step is to make a general investigation of the problem to see its main features. The particular object for which the data is sought should be as clearly defined as possible. This will help to eliminate the data that are not pertinent to the investigation. If great refinement appears to be required by the object in view, the investigation process should be more careful and intense than where the results to be secured do not require such refinement. This requires a careful evaluation of the data at the outset. The original evaluation may be changed later, but an evaluation of the data at the outset may result in the elimination of much data that are time-consuming and which may be abandoned later. Data which may not bear directly upon the problem should be discarded immediately so as to get at significant data.

The second step is to analyze and segregate the different components of the problem. In business there are usually several factors acting together to give a certain situation. The statistical method may be employed to isolate one of the factors for study. Such a process may be used to determine the probable relationship between the several factors, and if a definite relationship, or an approximation thereto can be established, much time and effort will be saved. For example, suppose it were found that a certain mathematical relationship obtained between the quantity of sales of certain goods and prices and population, or between the quantity of sales and the quantity of advertising, then the following would exist: In the first case, the information may assist greatly in setting up and checking every budget calculation. In the second case, the productivity of the advertising may be determined with a fair degree of accuracy. One of the most valuable features of this method of research is the finding of fairly definite relationships between different classes of data.

A third step is to provide the proper procedure for assembling the required data. The internal data must be reported as promptly as

¹ See J. H. Barber, "Budgeting Technique," A. M. A., Ann. Con. Series, No. 51. See also standard works on statistical methods.

the forecasting program requires. For instance, automobile sales of certain manufacturers to consumers are assembled every ten days. The several data should be assembled in a standardized way on standard forms. This will obviate many difficulties if the procedure is adhered to. External data may be secured from many sources; namely, trade associations, government and private agencies. This feature of forecasting is treated in Chapter XXIII.

The fourth step is to foresee the changes that will take place within the business due to cyclical changes. This is done largely by studies in business cycles, external as well as internal. The business enterprise usually purchases goods from and sells goods to others. It is therefore dependent upon others, in a large measure, for its success. If research studies can be made to yield valuable information regarding the cyclical position of those outside of the business, the plans of a particular business may be made with more confidence than formerly. For example, suppose that the cycle of a business lags behind the Harvard B Curve. The relation of the latter curve to various other curves, such as pig iron production, debit to individual accounts outside of New York, etc., may be ascertained. With the aid of this information, the position of the firm in relation to its customers, its suppliers, and to others may be ascertained. From such a knowledge of how the cycle has worked in the past, it is possible to tell one's position with relation to those with whom it deals. Such information gives the executive specific data that apply to his problems. The provision against the consequences forecast is a matter for executive action.

The fifth step involves a process of fitting the data together as a symmetrical whole. In budgeting, this is known as coordination. The forecast studies should be in quantities, or as a physical volume index. Statistical forecasts are usually stated in the form of a mathematical equation with a fixed and one or more variable items. These data must be converted into dollars, as of the particular budget period. This may be done easily by the use of an index number of the value of the dollar.

The sixth step is to subject the data to actual tests. The important question is: Does it work? The limitations of forecasting should be understood clearly. The forecast may be based largely upon the statistical method which has distinct limitations.¹ This method is

¹ See Mills, F. C., *Statistical Methods*.

based upon historical data, and a deviation from the average or other best guess data is entirely possible in a specific case. In budgeting, however, a somewhat wide departure may be made in predicting largely from certain statistical data. For this reason budgeting is an art; but the artist must know his facts and use sound judgment in evaluating his facts. So constructed, the budget is the one best guess.

The causes for the variations between forecast data and the actual data are vital to the perfection of forecasting methods. The underlying data may be corrected so as to permit of a more accurate forecast. A careful evaluation should be made, also, of the probable causes for variations between the budget and the performance. In this manner, the expertness of the guess work employed in the budget may be tested. For example, the statistical forecast may indicate a 5 per cent rise in volume, which may later be confirmed as correct, from external sources. The expertness of the guess in setting the volume for the budget may be judged from the variations from the confirmed volume, or the 5 per cent rise in volume. In a somewhat similar way the price factor may be verified in each case. In this way the effectiveness of forecasting procedure, the budget, and the performance of the enterprise may be verified. That is, the adequacy of the measuring stick may be tested and this stick may be used to measure the adequacy of performance.

Fixed and Variable Costs.—One of the most helpful methods to ascertain the “flexibility” of a business is to resolve the various “costs” into fixed and variable costs. Fixed costs are those costs which remain constant irrespective of the maximum or the minimum business secured, while variable costs will vary in some ratio according to variations above the minimum amount of business.¹ The variable costs may be divided into one or more classes, according to variability. In practice, it is advisable to set the minimum amount of business low enough to emphasize the effect on costs and profits when business is slack, and the maximum amount of business high enough to emphasize the effects of a boom period. In all cases, it should refer to a period in advance.

Suppose, for example, that a manufacturer expects to sell a minimum of \$1,300,000 during the coming year. He estimates his fixed and variable costs as follows:

¹ See J. H. Williams, “A Technique for the Chief Executive,” Bulletin of the Taylor Society, Vol. VII, No. 2. See also Hilgert, *Cost Accounting for Sales*, Ch. IV.

<i>Items</i>	<i>Fixed</i>	<i>Variable</i>
Net profits from operation.	\$100,000	.000
Manufacturing costs.....	120,000	.621
Selling costs.....	80,000	.072
Management costs.....	90,000	.007
Total selling price.....	\$390,000	.700

The accuracy of the above figures may be verified as follows: let y equal the total business of \$1,300,000.

Then $y - .70 y = \$390,000$.

.30 $y = \$390,000$.

and, $y = \$1,300,000$.

Suppose, further, that in securing the maximum amount of business which could be expected, the fixed and variable costs are as follows:

<i>Items</i>	<i>Fixed</i>	<i>Variable</i>
Net profits from operation..	\$100,000	.085
Manufacturing costs.	\$120,000	.601
Selling costs.....	\$ 80,000	.103
Management costs.....	\$ 90,000	.016
Total selling price.....	\$390,000	.805

To satisfy this equation the sales would be \$2,000,000. If the sales amount to \$1,500,000, what should the profits be? The profits would depend upon the type of curve connecting the two points. If the data conform to a straight line, the profit at intermediate points may be determined by means of a chart.

In practice, however, variable expenses are not usually constant, irrespective of the amount of business. Manufacturing costs may, and usually do, decrease within certain limits as production increases. After a certain amount of business is secured, the costs may tend to rise. A mathematical equation may be secured to represent these tendencies under given conditions and to serve as a guide in setting prices and in controlling costs.

The Profits Point.—It is often desirable to know the amount of business that must be secured at certain prices, costs, and profits in order to “break even.” This is known as the profits point. In the preceding illustrations, the amount of sales was determined which would fulfill the costs and the profits requirements. If the net profits

from operation be eliminated from the equation, the profits point may be determined. The fixed selling costs would be \$290,000 and the variable selling costs, in the first case, .7 y. The profits point may then be found at \$966,666.67 ($\$290,000 \div 30\% \times 100$). At the maximum sales of \$2,000,000 the variable cost amounted to 72 per cent. In this case, the break-even point would fall at \$1,035,714.28 ($\$290,000 \div 28\% \times 100$). The profits point for any particular volume of sales and costs may be determined in like manner.

Index Numbers.—A variety of methods have been employed in the construction of index numbers.¹ Internal and external business data must be studied by means of index numbers, if they are to be understood properly. Quantitative data, in a sizable concern, can usually be studied best by means of index numbers. This is true also of prices. Prices are quoted on the customary units of trade, and when a concern sells hundreds of different kinds of commodities, the analysis and the interpretation of the units and prices would be an impossible task. If, however, the several units could be expressed in terms of an index number, the data may be understood easily and interpreted properly.

As may be suspected, there is no uniform method that can be used in the construction of index numbers. Each concern must select the type of index which seems to serve its purpose best. Where a variety of lines of products is dealt in, it is usually advisable to have an index of units and of amounts, or of prices, and of amounts by lines of products. The several data may then be combined into a general-purpose index. This index may be used to analyze and interpret the broad features of the business, such as balance sheets and operating statements. It may be used also as a barometer for measuring changes within the business as compared with changes outside of the business. This may be used for prices and for production. In this manner, the business may ascertain its position in relation to others at frequent intervals. Suppose, for example, that research studies indicate that the price of commodities in the industry or trade in which a particular concern is engaged has a three months' lag behind some recognized index number, such as that of the Bureau of Labor Statistics, Federal Reserve Board, etc. This may place a powerful tool in the hands of management for the effective control of its operations.

¹ See F. C. Mills, *Statistical Methods*, Chs. VI and IX, and references therein.

The study of general business conditions has done much to explain the workings of the price system, but before individual enterprises can benefit consistently from such information, they must know their relation to general and to specific industries, and with particular reference to those with whom they deal. Index numbers of quantities and prices will do much to enable the individual enterprise to control its operations wisely. Without proper index numbers it is almost impossible to ascertain the true position of an enterprise in relation to its customers and the general public. The subject is, however, too broad to receive further discussion here.

Standard Costs as an Aid to Statistics.—Standard costs make possible the preparation of valuable statistical data relative to costs. Statistical analyses of standard costs may do much to help the management to see that the proper relationship exists between costs and prices. The application of standard costs to internal statistical problems brings order out of chaos. The basic data with which such statistics deal are made relatively stable, and they rest upon a more secure foundation than is usually obtained where retrospective costs are employed.

The various standard cost data may be combined easily by statistical methods. Units and prices are requisites to standard costs and proper statistics. Standard costs secure these data in a satisfactory manner for statistical analysis. Of course, cases may be found where a particular method may be employed which will not secure reliable results. It is assumed that the proper research has been done before methods are put into operation. Few, if any, management tools are fool-proof, but most of them are relatively simple to the adept.

Flexible Budgets.—A study of the fixed and the variable costs may lead to a satisfactory basis for the control of an enterprise. The key to this type of budget may be the amount of sales, for example. Suppose that the following conditions obtain in a concern:

<i>Items</i>	<i>Sales</i>	<i>Profits</i>	<i>Costs</i>
Maximum.....	\$2,000,000	\$ 70,000	\$1,830,000
Minimum.....	1,300,000	100,000	1,200,000
	<hr/>	<hr/>	<hr/>
Difference.....	\$ 700,000	\$ 70,000	\$ 630,000
	<hr/>	<hr/>	<hr/>

The variable cost is 90 per cent ($630,000 \div 700,000$). The fixed cost may be determined as follows:

<i>Items</i>	<i>Minimum</i>	<i>Maximum</i>
Sales.....	\$1,300,000	\$2,000,000
Per cent of variable cost.....	.90	.90
Amount of variable cost.....	\$1,170,000	\$1,800,000
Total cost, as above.....	1,200,000	1,830,000
Fixed cost.....	\$ 30,000	\$ 30,000

If the sales for the period amount to \$1,500,000, then the costs would be \$1,380,000 (90 per cent of sales plus \$30,000) and the profits would be \$120,000 (or 10 per cent of the sales less \$30,000).

In the illustration above, costs include all items that enter into net profits from operation, with the exception of sales. This item of cost may be analyzed into manufacturing costs, selling costs, or expenses and management costs. The equation may be determined for each cost item. If costs are determined at three or more points, a curve may be fitted to these points and the equation determined for the purpose of ascertaining the intermediate values. Such equations may serve to indicate the point of greatest profit. This may be done also by computing the various costs at several points; *e.g.*, for each increase of \$100,000 of sales, and plotting the data. The diagram may serve as a mental picture of what will take place under given conditions.

If, in the preceding illustration, we assume that the total cost and profits conform to a straight line, which they would, then we have an increase of 30 per cent (100 — 70) for each dollar of sales. The percentage, however, does not increase at an arithmetic rate, but at a geometric rate. This is the important thing to understand. At the maximum sales the variable percentage is 80.5 per cent of the sales, while the profits compose 8.5 per cent of this amount, which shows that the variable cost percentage increased 2 per cent (72 — 70). Thus, while the cost percentage has increased 2 per cent, the profit percentage has increased 8.5 per cent. This may be used to emphasize the profitableness of the several increments of \$100,000 of sales.¹ If concessions are made to secure the last \$100,000 of sales it would, of course, affect the calculation, but this may serve as a check against price concessions that unduly affect the profits margin.

¹ See D. S. Kimball, "Minimum-Cost Point in Manufacturing," *Manufacturing Industries*, January, 1927, pp. 22-24.

CHAPTER XIV

ACCOUNTING AS AN AID TO THE MANAGER OF MARKETING

Marketing Defined.—Possibly the easiest way to define marketing is to say that it is composed of those activities which have to do with publicity and selling. This viewpoint is, of course, that of the individual enterprise. Several phases of publicity and selling will be treated in the two following chapters. The broader phases of the subject are treated in the present chapter.

Organization.—There are so many functions and such close interrelations in a business organization that it is quite essential to proper organization to have the minor functions of the business grouped into major functions. The idea of expecting the chief executive to deal directly with every phase of the work within a business has long been abandoned in the practice of many sizable concerns. Some writers, however, still emphasize the importance of functionalizing a business in such manner that the chief executive must deal directly with as many departments as have received recognition in the organization.

The marketing function is a major function of every enterprise. It is a function which requires more attention in some businesses than in others. In order to have continuity of effort the two main phases of marketing must be in accord. Possibly the best way that this may be accomplished is by the combination of these phases under the direction of a manager of marketing. In a small organization, the chief executive may perform this function; however, it is not his function in a well-organized business.

Figure 19 shows the major organization chart of the marketing phase of an enterprise. The chief executive, as the head of the organization, depends upon the manager of marketing to coordinate the functions of marketing. For purposes of convenience, these functions have been shown in this chart, in terms of the organization, as the sales manager and the publicity manager. The manager of marketing "weighs" the activities under his direction, and the chief

executive "weighs" the activities of this major function in conjunction with the other major functions of the business.

The manager of marketing should be assisted by such a staff and such other employees as he may require to carry his functions into operation. Mr. Dennison has pointed out the advantage of merchandise managers to assist in this work. He says:

Over a period of years, the task of merchandising has been found to consist of four elements. These are:

- i. The study of the merchandise relative to:
 - a. Creating new merchandise
 - b. Finding new uses for standard merchandise and

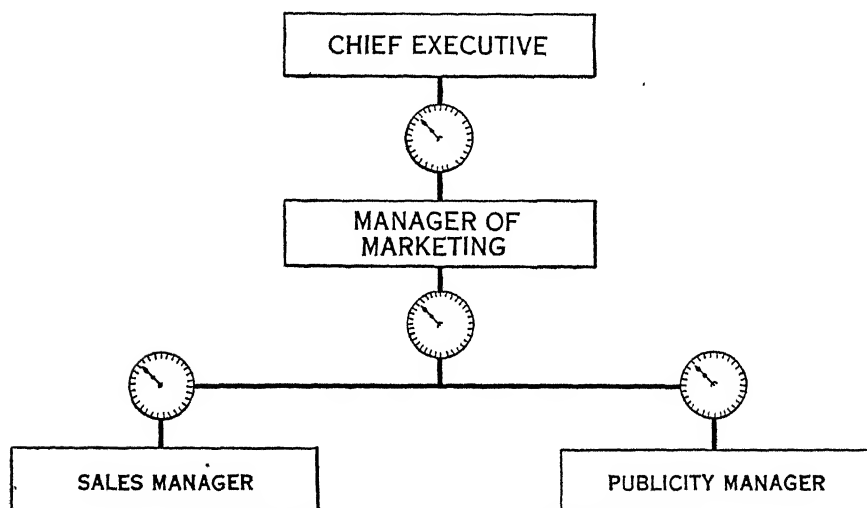


Figure 19. Organization for Marketing Control.

- c. Watching the trend of the market, particularly to avoid the retention of items that give indication of becoming obsolete.
2. The study of the merchandise relative to estimating the amount of production necessary to meet the market requirements at different seasons and periods.
3. The study of the merchandise relative to making price estimates on special merchandise and to making changes in list prices of stock merchandise.
4. The study to make each line of merchandise of continuing interest to the selling organization.

To carry on this job of merchandising calls for a very special set of qualities. The successful merchandiser must have analytical power of no mean order. His analytical power must be buttressed by an exhaustive knowledge of the goods he is merchandising and a working knowledge of the business of many other people who may use the goods. Not only must the merchandiser have a

background of facts, but he must, as coordinator between factory men and sales department, be able to put his deductions from these facts before a great many different sorts of people. This is a teaching problem calling for both patience and resourcefulness. This means, too, that while the merchandiser has his headquarters at the factory, a great deal of time must be spent in traveling, so that he always has a direct contact with marketing conditions.

More than all else, the merchandiser must have and use constructive imagination. If he only piles up trade facts he becomes pedantic. If he is only imaginative he may be foolish. But by applying imagination to the facts of his merchandise and keeping in mind the total situation, he builds a solid basis for successful merchandising.¹

That organization has six merchandise managers, each responsible for the merchandising of a line of commodities.

The Functions of the Manager of Marketing.—The principal functions of the manager of marketing may be classified as follows:

1. A director and a coordinator of the marketing activities.
2. A student of markets and marketing methods.
3. A counselor of the minor departments under his direction, and
4. A member of such committees as affect marketing.

Each of these functions will be discussed briefly.

The chief reason for having a manager of marketing is for the purpose of coordinating and directing the broad functions of marketing. The marketing function is one of the major functions of a business and unless it be headed by a manager of marketing, the principal minor functions of marketing must be dealt with by the chief executive or by some other official. If the work is not treated as a whole, there are grave probabilities that its effectiveness will fall short of possible attainment. Every business of any magnitude can testify to the losses that occur because of a lack of coordination in the marketing functions as well as other major functions. A number of enterprises have failed for no other reason than that the sales and the publicity functions were out of "tune" with each other. Much wasted effort has been expended because of the failure of the sales and the publicity departments to appreciate each other's problems and to cooperate in their solution. The general principle of organization may be stated as follows: the highest management efficiency is obtained by functionalizing the duties of the executives along horizontal and along vertical lines. This means that the highest efficiency will be obtained only where the horizontal structure of the organization is

¹ Bulletin of the Taylor Society, Vol. XII, pp. 526-527.

properly coordinated by a vertical structure. The minor functions of a business should follow a horizontal analysis, while the major functions should follow along vertical lines. Mr. H. A. Fountain¹ thinks that there should be three and only three levels of responsibility. Such a structure has many advantages. The limitation to three levels, however, may not be necessary or desirable in many cases.

During the last few years considerable attention has been paid to the study of markets and marketing methods. The study of markets is largely a study of goods and of prices. The study of marketing methods deals with the ways and means of creating an effective desire for goods and of securing distribution to consumers. The marketing problem should be attacked as a whole, if the most effective results are to be secured. Marketing strategy cannot be successful along the lines of battle strategy for which Napoleon is famous. His idea was to divide the enemy into a number of parts, then conquer each separate part. It does not appear that a study of markets as a semi-isolated problem could be as effective as if it gave due consideration to marketing methods and to other marketing and business factors. Publicity is a vital factor in selling. To divorce the two is to court failure.

The manager of marketing, as an executive, performs an important function in providing a source where the minor executives can secure sympathetic and intelligent counsel. The minor executives "try out" their ideas on the major executives, and in this way they become more tangible, better considered, and more practicable. The major executive and his staff have more time to devote to the detailed consideration of matters which may come to the attention of minor executives. He should be a source of inspiration to the minor executives. His fact-finding approach to their problems will do much to foster the right relations between them.

A number of businesses have found that some of their work can be done best by a committee. This is particularly true where the work to be accomplished involves two or more major functions, or two or more of their individual functions. Thus, a complex question involving advertising and selling may also involve procurement, personnel, and finance. To cope with such problems, a committee may be formed in order to bring together specialists in the several fields for the purpose of securing a solution which may be more satisfactory than may be obtained without such balanced knowledge.

¹Treasurer, the Ohio Public Service Co., in "Departmentalizing Management Organization Structures," *American Management Association*, 1928.

Accounting Tools for Marketing Control.—There are two general types of accounting tools for the use of the manager of marketing in the control of an enterprise. These are (1) the budget, and (2) performance reports. There are a considerable number of phases of each of these means of control, the chief of which were set forth in Part III. The special features of these tools, as they are related to marketing, form the major subject for discussion in Part IV.

It should be observed that there are many different phases to each of the accounting tools used in the control of marketing. Whether or not the best methods are used to carry out the work in the most economical manner is subject to check only by expert opinion. The particular methods of attaining a given end is of major importance, in many cases. In practice, too often no attention is paid to the experience of others or in following as scientific a procedure as may be necessary to secure the best results. Competition is exceedingly slow in weeding out the less efficient methods. The new and the old exist side by side. Often the old is continued far beyond its usefulness because of a lack of definite knowledge as to the true difference in economy between the new and the old. Changes in marketing management are exceedingly slow, and at least a generation behind the best practice in manufacturing management. The adoption of the science of management in marketing by a number of leading concerns is of recent origin. For the most part, it appears that the advertising agencies are largely responsible for this change. The proper use of accounting tools will do much to hasten the science of management in marketing.

Marketing Research.—Several forms of research underlie the science of marketing. In general, marketing research consists, on the one hand, of a scientific analysis of buying power, habits, traditions, customs, prejudices, and the effective desire of consumers for goods. On the other hand, it seeks a thorough analysis of the product, methods of distribution, and channels through which it can be effected, costs of distribution, kinds and extent of distribution, and price studies of particular goods. In all cases the studies are made for the purpose of "prediction." Classified along broad functional lines, marketing research may be said to be composed of research in selling, publicity, and their interrelations.

The study of the business cycle, the budget, and advertising has done much to emphasize the necessity for careful market research. Several concerns have been able to offset many of the wastes of the

business cycle by careful market research. The Dennison Manufacturing Company, for example, released new products during a depression and succeeded in stabilizing their business. The usefulness of the budget as a management tool has emphasized the necessity for market research to ascertain the probable correctness of the budget. It was soon realized that since the budget is based on the future, a good knowledge of what will happen in the future is very desirable. This pointed immediately to marketing research for the purpose of ascertaining a basis for the budget. The desire to secure a wide distribution of goods led to advertising. The advertising specialists have realized that much money can be wasted in advertising. In order to get better results from advertising they have taken steps to provide marketing research first, and on the basis of the findings the advertising campaign is planned.

There are many forces, other than the ones discussed above, that are at work to focus attention on marketing research. Some of these are: to determine the sales and the advertising possibilities of products; to improve the product from the marketing viewpoint; to find products which will lend themselves best to the desires of a stratum of population which can be reached most easily with the means at hand. Since marketing research is basic in many phases of management, the subject will be treated specifically at a number of points.

Marketing Forecast.—The basis for operation of any business is that of the market forecast. In practice, it is often said that the sales budget is the basis for operation. This is, however, likely to be misleading because a great deal more than the sales should be considered before a basis for action is established. The term “merchandise budget” would be more appropriate than “sales budget” because merchandising takes into consideration not only sales but also the questions of gross and net profits margins, as well as many other questions. This term does not seem to indicate the true nature of the basis for forecasting as does the term “marketing forecast.” The marketing forecast should give due consideration to the following factors:

- (1) The gross and the net profits policies of the individual enterprise.
- (2) The policies of the firm which may affect publicity, selling, finance, and other general policies of the business.
- (3) The prices for which particular commodities can be sold during a specified period.

- (4) The analysis of selling and publicity costs into units, prices, and amounts, by groups or by individual products, and,
- (5) The gross and the net profits margin that may be obtained on certain quantities of specified goods.

A brief discussion of each of the above factors may serve to emphasize the importance of a proper consideration of the market forecast.

Gross and Net Profits Policies.—A wise marketing plan should reflect the gross and the net profits policies of the enterprise. Few enterprises, it is true, have fairly definite policies regarding gross profits. The point is, however, of considerable importance. For example, a wisely managed department store segregates the different commodities so that a standard mark-up on the cost of commodities in a department will yield the desired net rate of return. The commodities must have cost about the same, if a standard mark-up is not maintained, or the inventory taken by the retail method will not be a satisfactory check upon the cost of the merchandise. Again, a commodity which would have to bear a high gross profit, because of a high marketing cost, may not be undesirable from the viewpoint of a given enterprise. It may serve easily to class the business as a "high-priced" concern. Where the sales price is practically uniform, this criticism is less likely to obtain. Considerable progress has been made during the last few years in stabilizing the percentage of gross profits on particular classes of goods. A maximum and a minimum gross and net profits policy on particular commodities may do much to eliminate "undesirable" goods and to protect the profits margin.

The marketing forecast must give due consideration to the net profits margin. This emphasizes the necessity for unit costs. It is not to be inferred that every item must yield an amount for net profits based on average marketing costs. Many articles are almost invariably sold at a loss in some businesses, if marketing costs be based on accounting averages. For example, staple groceries, such as flour, sugar, butter, and eggs, are said to amount to between 40 per cent and 60 per cent of retail grocers' sales. Usually the spread between merchandise cost and sales price does not allow for marketing costs and no profit is received, if these calculations be based on general averages. From the viewpoint of fair prices and fair profits, all commodities do not have to bear the same profits relationships. The object should be to give consumers the biggest and best assortment of goods for their money that is consistent with a fair profit, after due consideration of unit

total costs and other factors. It may be well to emphasize here, that while retrospective cost accounting usually tends to consider an average "actual" selling cost for all commodities, this is neither a "reasonable" nor a socially desirable basis for fixing sales prices.

In fixing prices, a standard cost, standard expenses, and a standard profit must be considered for each article. The fact that an article bears a greater or a less marketing cost, or a greater or less profit than an average cost or profit for an enterprise does not affect its reasonableness nor its fairness. Ivey says: "A fair price directs the flow of wealth in directions which are socially desirable."¹

"Average cost" and "average net profit" should serve as a check upon the higher and the lower limits in marketing operations. It is not likely that the standard marketing cost and profits for any item will be the same as the average costs or profits for the business. From this it will appear that the staple groceries may be priced so as to yield a satisfactory and fair profit even though the average "mark-up" is less than enough to pay for "average costs." The volume of the staple grocery sales is high, and this lessens the percentage cost of doing business on the whole of the sales. A simple illustration may serve to emphasize the importance of a truth which is too often overlooked. In Table 23 are shown three groups of commodities with a statement of

TABLE 23
THE DETERMINATION OF FAIR COSTS AND PROFITS

Items	Group 3		Group 2		Group 1		Total	
	%	Amount	%	Amount	%	Amount	%	Amount
Sales.....	100	\$5000	100	\$10,000	100	\$15,000	100	\$30,000
Cost of sales.....	60	3000	70	7,000	80	12,000	73.4	22,000
Gross profit.....	40	\$ 2000	30	\$ 3,000	20	\$ 3,000	26.6	\$ 8,000
Selling costs								
Management costs								
General costs								
Sub-total.....							20.	\$ 6,000
Profits.....							6.6	\$ 1,000

the net profit. The gross profits relation to sales by groups are as follows: Group 1, 20%; Group 2, 30%; Group 3, 40%. If the "overhead costs" be distributed on the basis of the sales, Group 1 would appear to be sold on a "no profits" basis. If, however, the fixed expenses amount to \$3,000 plus 10 per cent of the sales, it will be observed that Group 1 earned one-half of the profit. If the fixed ex-

¹ *Principles of Marketing*, p. 229.

penses are \$5,000 for the first \$20,000 of sales and 10 per cent for all sales above that amount, then without Group 1 no profit could be earned. Such calculations may serve to help decide the assortment of profit margins, but the consideration should always be given to evaluations which will secure for the consumer a large and socially desirable assortment of goods for his purchasing power. For obvious reasons, too, a "full line" must be carried in stock. From the standpoint of individual commodities and individual firms, this means that research studies in prices, costs, and profits are essential to sound social and economic service, which are vital to the continued success of a business enterprise.

Effect of General Policies on the Marketing Forecast.—The marketing forecast should give ample consideration to the general policies of the concern at the outset. The financial position of many businesses is such that this phase of administration and management must be the governing feature. An advertising campaign may offer very promising possibilities, but the finances of the firm may not permit of the necessary outlay of funds. Several firms have become bankrupt because they were not able financially to manufacture and sell the commodities for which a demand had been created by extensive advertising.

If the concern can finance the improvements and plans that may be drawn, then the important question is that of ways and means for accomplishing the desired results.

The Price Forecast.—Price studies are basic to marketing research, and marketing research is basic to marketing control. The basis of the price forecast is the study of the several factors which affect price, such as quantity, quality, purchasing power, desire for the goods, profit ideals, cost of goods, cost of marketing, comparative value of competitive goods, and, in some cases, other special factors. Thus the study of prices involves other closely dependent problems.

The forecasting of prices is made difficult because of several factors which affect price. Usually, for purposes of convenience, the several factors are resolved into two factors; namely, quantity and price. In some cases one factor is held practically constant while the other factor fluctuates. For example, prices may be fixed, then the other factors will affect quantities. But prices may not be set intelligently without reference to quantities. In practice, prices are fixed in a variety of ways. The usual explanation is that they are fixed by "supply and demand." Such an explanation takes much for granted and

leaves much to be desired. In modern business the forces of "supply and of demand" do not work as they are supposed to. For example, the price of crude oil and its constituent products are determined by "supply and by demand," according to the usual type of economic analysis. The "cost of production," under this kind of analysis, is supposed to set prices "in the long run." Statistics show, however, that more money has been spent in "prospecting" for oil, for example, than the product has been sold for. If the manufacturing and marketing cost be added, it appears that the constituents of oil have been sold at a large net loss, periodically, as well as over a long period of years.¹ Other illustrations could be cited, if space permitted, which would show, as does the above illustration, that the usual explanation of prices is not applicable to modern business.

How, then, are prices determined? There is no general answer to this question. That is why price studies are essential to sound business strategy. The forces at work on specific prices undergo changes from month to month. Many of these forces are capable of administrative and of executive control. For example, advertising can be a vital force in causing a product which has had little use to become a necessity for millions of people. Breakfast foods, matches, bathtubs, toothpaste, cleaning powder, automobiles, and electric lights are only a few examples. Other illustrations may be found in every field of management, as shown at interrelated points in this treatise.

The price forecast for individual commodities resolves itself into a predetermination of the quantity of goods that can be sold at given prices during a given period in advance. Accounting methods of the highest type are necessary to aid management in this task. The statistical method, external and internal statistics, and other generally recognized branches of science, as well as other branches of learning, are often essential to solve the problem satisfactorily. A fundamental

¹ The truth of this may be gleaned from the following type of analysis: take the capital stock issued to oil companies incorporated in Texas, Oklahoma, Louisiana, Arkansas, Kansas, Montana, Pennsylvania, West Virginia, California, New Jersey and Delaware, from 1910 to 1928, inclusive, and correct this for inter-company holdings in the well known concerns. This total represents money invested in corporations. Any errors which may be made by this process will be covered by the billions of dollars spent in prospecting by persons other than corporations. The other side of the picture may be secured from data regarding production, as published by the Department of Commerce. For ease in computations, the weighted average price of crude oil may be used. Refinements in method lead to the same general conclusions, that is, that money is sunk for the chance of a *prise*, which so often fails to materialize. It is estimated that the public speculated in oil prospecting to the extent of three billions of dollars in 1919 and that five hundred millions of dollars would have paid for all the drilling done. The Department of Commerce estimates that the value of the oil produced in 1919 was only seven hundred and sixty millions of dollars.

approach to the problem may be through an analysis of costs and profits, to which attention will be directed.

The Analysis and Forecast of Cost.—In the analysis and forecast of cost many interrelated problems must be dealt with. For purposes of analysis, costs may be divided into the following:

- (1) Procurement cost.
- (2) Marketing cost.

To determine net profit from operation, no hair-splitting definitions are required for the purposes of segregating all cost items into these two classes. It is intended, however, that procurement cost include all costs up to the time the goods are ready for market. Marketing cost includes all other than procurement cost. This is not in agreement with previous or with subsequent classifications, but is used because it seems simpler for the present purpose.

Procurement Cost.—Many enterprises compute a procurement cost, or some other "cost," to serve as a base in computing sales price. Such a base serves a very important purpose in the analysis of prices. A clear analysis of procurement costs may serve a very useful purpose in a price study. This analysis should provide a "direct" and an "indirect" procurement cost for each commodity. Each item should be stated in terms of a standard, if possible. A definite amount for each of these items should enter into a comprehensive price study.

Before procurement costs can be determined, many cost factors must be considered. These factors are treated in the chapters on cost accounting, procurement control, and other interrelated points. For this reason, no further consideration can be given to this subject here.

In many cases the cost approach to the study of prices may seem to be blocked because it is not possible to state the cost of a particular commodity. It should be understood, however, that cost is here understood to mean cost determined by standard cost methods, or by the science of and the art of "merchandising cost computation." This is discussed below. In modern industry, cost determination is largely a matter of expert opinion, as indicated in Chapters IX and XI.

Marketing Cost.—Marketing costs are usually an important item in a price study. All cost studies should relate to specific and to practical conditions. In marketing the problem may be approached in somewhat the following way: given a certain group of commodities, what will it cost to market given quantities of these commodities at given

prices in a given time? The determination of fixed and variable costs will do much to aid in price studies. If an article will require special marketing cost, as direct selling, direct advertising, or other direct costs, these costs should be segregated according to services and commodities. Cost analyses by departments, by territories, by methods of marketing, and by other classifications may assist greatly in the analysis. The particular analysis desired will depend upon the purpose for which it is to be used.

It should be emphasized that marketing costs, like procurement costs, should be determined largely by merchandising cost computations. That is, the marketing cost of a number of different commodities should not be computed on the basis of general averages. Due consideration should be given to the social value of different goods, so that the marketing cost of commodities may be said to reflect an index of social value. In practice, the shrewd merchandiser may be said to "distribute" his marketing costs on the basis of the salability of goods. In other words, his percentage mark-up is governed largely by the salability of the article. He also eliminates as many of the low profit articles as conditions seem to warrant. The principal factors which affect salability were enumerated under the "price forecast."

What has been said about the marketing forecast, to this point, has been largely of an introductory nature. The principal study of prices is focused in a study of gross and of net profits from operation.

The Forecast of Gross and of Net Profits from Operation.—

In accordance with the definitions used above, the net profit from operation may be determined as follows:

Sales.....	\$00,000
Less: procurement cost.....	00,000
Equals: gross profit.....	\$00,000
Less: marketing cost.....	00,000
Equals: net profit from operation.....	\$00,000
Other income and other expense, net.....	0,000
Equals: net profit.....	\$00,000

The manager of marketing is interested in the average spread between the gross and the net profits from operation, and it is in this light that he should study merchandising plans. In the study of individual prices, the manager of marketing, or a merchandise manager under his direction, must have some method of evaluating the various

classes of goods for the purpose of setting their sales price. Here, general averages of gross and of net operating profit serve only as a guide for fixing the upper and the lower limits of prices. It has little, if any, use in setting individual prices.

A rational study of commodities and the forecast of prices resolves itself into questions of merchandising cost computations. In practice, the problem must be attacked largely from the viewpoint of the individual enterprise, but a study of an industry, in relation to other industries, may be the most satisfactory solution to particular price studies. The present discussion will be limited to the viewpoint of the individual enterprise. It may be desirable to acknowledge that the basis of this discussion is founded not upon "general practice," if there be any, but upon the science, art, and the philosophy of management, as set forth in this treatise, and practiced more or less consistently by a number of businesses that are considered to be managed well.

The subject may be understood more easily if it be approached from the viewpoint of a firm that manufactures and sells a single commodity. Research studies should develop a forecast of standards for each of the following: procurement cost, marketing cost, and the volume of commodities that can be sold at given prices. Each forecast should be stated in units and prices and analyzed into minor subdivisions. The fixed and the variable net profits from operation may be determined by research studies and administrative standards. From these factors, the sales forecast and the forecast of gross and of net profits from operation may be made. The ways and means by which research studies may be used to assist in this forecast are to be found at various points in this treatise.

Where a concern procures and markets many commodities, the forecast of procurement, marketing costs, and the volume and prices for which individual commodities can be sold is more complex. In a complicated case, the commodities may be grouped in such a manner that a given percentage mark-up will yield a satisfactory gross profit. Commodities can be grouped so that their salability and their social value will be of somewhat similar character. This emphasizes the importance of different concerns classifying similar products in a uniform manner and the use of a standard mark-up percentage. The same problem may be attacked by having a uniform mark-up to apply to individual products.

The forecast of gross and of net profits from operation can be made best by the use of internal statistical and other accounting data. Such information furnishes a basis for the study and formulation of the merchandise plan. The classification of commodities and the selection of the percentage mark-up required to yield a stated return, is a subject for research and merchandising cost computations. The individual articles which compose a group of commodities must be studied individually and in relation to the group. In this study, the accounting data developed may be of considerable value to management in merchandising cost computations. In other words, these data may be used by management to select the particular commodities that are to be sold, and in pricing them so as to earn a fair return upon the investment and to secure for the consumer a proper assortment of commodities for his money. A study of the commodities to be marketed in this manner will enable the manager of marketing and the other executives and the administrators to arrive at a forecast for gross and net profits from operation.

The Marketing Budget.—The basis for the marketing budget is the marketing forecast. It must be preceded by a study in merchandising and in merchandising cost computations. The marketing budget is a definite plan for action and is based upon the merchandising study and the marketing forecast. From the functional viewpoint, as developed herein, the merchandise budget is a consolidation of the sales and the publicity budgets. These budgets are treated in the two following chapters.

Reports for the Manager of Marketing.—In the performance of his duties the manager of marketing will require many reports. The exact nature of these reports will depend upon the requirements of the particular case. There are, however, certain reports which are common to every business that the manager of marketing requires. They may be classified as follows:

<i>Items</i>	<i>General Type of Report</i>	
	<i>Budget</i>	<i>Performance</i>
Sales	"	"
Cost of sales	"	"
Sales expense or cost	"	"
Advertising expense or cost	"	"
Administrative and management costs	"	"

In each case the report will be somewhat different from reports rendered to the sales or the publicity manager. The point of departure should be along the line of emphasis. The manager of marketing is not

interested, for example, in the performance of individual salesmen. That is not his function. He is interested in marketing forecasts, budgets, merchandise studies, performance reports, comparisons of performance and budgets, and causes for variation between them. These reports should be analyzed in terms of the organization so as to enable him to appraise performance in the light of pertinent standards for the individual organization units under his direction.

The manager of marketing is vitally interested in several phases of every department in the organization because they affect marketing. The cost of goods sold, the cost of selling, of advertising, of administration, of management, and of general costs are vital factors to him. This is true for budgets as well as for performance. A well-rounded knowledge of the several functions are necessary for the economical and wise management of the marketing function. For example, a manager who is not well versed in the financial status of the concern may cause it serious embarrassment by encouraging unwise expansion, unwise competition, and by many other ways. The technical part of the work of each function, however, is a matter for each function to handle. This enables the manager of marketing to secure reports which are ample for his purpose. The major part of these reports are embodied in the budget, or are related to it.

The Reports of the Manager of Marketing.—Accounting is not only used for rendering reports to administrators, managers, and others, but it is also used by them in rendering reports to one another and to the business. The proposed budget is a conspicuous example. In general, the controller is the principal source for the rendering of accounting reports. The manager of marketing, however, renders a valuable accounting report in the form of a marketing budget. In general, the accounting reports rendered by the manager of marketing have to do with the budget or with proposed marketing budgets.

Accounting to Aid in Marketing.—Up to this point the treatment has been along the more general phases of accounting to aid management in marketing. The heart of the question, however, lies deep beneath the surface of budgets, general balance sheets, and profit and loss statements. The scientific method must be used to attack the problems of marketing if a proper understanding is to be had of such problems. The end and aim of such studies is to find ways and means by the application of which goods and services may be provided at a minimum price. This must be done by research and study and the application of management action to secure the results indicated.

The larger phases of the subject will be treated under the following interdependent headings:

- a. Best channels for selling particular goods.
- b. Which goods need special salesmen.
- c. Which goods can be sold best in groups by a salesman.
- d. What combination of articles and services will secure the largest profit.
- e. What effect has the location of merchandise in the "store" upon the sales, prices, costs, and profits.
- f. What proportions of merchandising effort will secure the best results.

The first three questions are closely interrelated with sales management and will be developed in the following chapter.

Before proceeding to the subject proper it is essential to differentiate between "cost accounting" and "expense accounting." The term "cost accounting" is used to cover a variety of ideas of cost computations. Much of the "cost accounting" is plain "expense accounting." That is, particular expenditures for labor and materials are added to overhead expenditures to find the "actual cost." A very different idea of cost accounting was referred to previously as "merchandising cost computations." This type of accounting is basically different from "expense accounting." It refers to future costs. It is primarily interested in what the profits are likely to be under different plans to which the management could adjust itself if the proper action were taken. The viewpoint of cost accounting is "prospective" while the viewpoint of expense accounting is "retrospective." The steps taken for the solution of the problems are likewise very different. The procedure used in "expense accounting" is often one based on precedent and one to which little constructive thought has been given. To illustrate: unit costs in factories may be computed, when what is needed for better executive control is "costs in terms of economic lot sizes" In the marketing field, cost may likewise be computed on a unit basis when what is needed for executive control is cost in terms of the unit of service, or of the economic lot size, or of the balanced lot, or some other basis. More than one basis may be necessary to emphasize salient points. In viewing costs from a prospective point of view, the merchandising cost computations are not very likely to become stilted.

Merchandise Combinations to Secure Largest Profit.—The business man is prone to add more departments, more products, and various classes and degrees of expansion without attempting to discover, by appropriate research, the most profitable combination of articles. Merchandising cost computations, it appears, are carried on in the minds of executives. The usual records and reports which the executive receives are designed to show the financial results of a large miscellaneous group or groups of transactions. The result is that no comprehensive cost accounting is done. In many cases, expense accounting is employed to determine financial results. The expenses of an enterprise may be distributed to the several departments so as to determine the profit by departments. Expense accounting, however, is usually a poor tool for executive action. The classification of items in the profit and loss statement ignores "the" important requirement—an adequate knowledge of the individual items which entered into the general average. Research and further analysis are necessary.

A study in merchandising cannot proceed far until consideration is given to the customer. The location and the requirements of present and prospective customers should be known. Knowledge of the variability in the cost of articles and of services as quantities vary is also fundamental. Information should be available as to how customer requirements will vary with prices. The general financial and merchandising policies of the firm should be known. With this information, computations may be made to determine the combination of merchandise which will yield the largest profit.

The results secured by a concern may be used to emphasize the importance of adequate study of the problem of "maximum" profits. One concern found that about 90 per cent of its business came from about 10 per cent of its customers, while over 80 per cent of its expenses were required to sell the 90 per cent group of customers. The analysis showed that a larger increase in profit would result if 90 per cent of its customers were abandoned; and if a substantial proportion of them could be kept and served by less expensive sales methods, a still greater profit would result. Another concern discovered that if about 75 per cent of its "business" were abandoned, prices on the remaining items could be lowered 20 per cent and result in over twice the previous earnings. Despite the fact that extremely large savings could be made if proper profit studies were made, few executives have realized its importance.

Proper Merchandise Location.—In a sizable concern the question of proper location of the merchandise is a problem to which little scientific study has been given. It holds large possibilities for savings in many businesses; in store rooms, store location, as well as on retail floors. The subject is, however, very broad, and the present treatment will be confined to a statement of some of the factors involved in the study of merchandise location in the retail store. The location of merchandise in a sizable store affects the sales, the costs, and the profits. This has been demonstrated in a number of instances. The managers of prominent stores recognize this fact. Many patrons of these stores are unwilling to take the time and the energy to look for articles they wish, where there is no special price inducement, etc., because it is much easier to get them elsewhere. The business lost by particular stores due to faulty merchandise location is unknown, but it is very likely much larger than the executives of most stores realize.

Some of the most important factors to be considered in estimating the effects of merchandise location on the profits, prices, and costs of a large retail store are:

- a. The customers of the store, their needs and their purchasing power.
- b. Who does the buying.
- c. The size and location of the floor space available for sales rooms.
- d. The type and grades of the merchandise to be handled.
- e. The equipment available for transporting patrons from one place to another, the layout of the building and equipment and cost of making changes.
- f. Congestion centers. Time required to complete a sale. Time required for shoppers to look at merchandise. Rate at which people pass from one center to another.

The evaluation of the several factors which may require consideration in particular cases should be made only after careful research and planning. This research and planning should have as its definite aim to find the location for each class of merchandise which will give the largest net return for the business.

In the case of a large concern which handles many items the approach to the subject may be made by a study of the family budget. The different items may be grouped according to the frequency of purchase. With such a grouping of commodities the customers could

make their purchases with a minimum of effort. The profitableness of each item or class of items may also be recognized so as to allow customers to buy the highest profit items with the greatest ease. Studies should be made to determine the articles best adapted to spaces not required for one class of items in the family budget but not large enough for the next item in frequency. In a large store it may be necessary to recognize more than one group of customers because of wide variations in purchasing power.

Who does the buying is another important problem. Women, the recognized purchasing agents of the household, do not make all the purchases. It is well established that, in general, men will not spend as much time and effort in making purchases as will women. This factor should be weighed in making the final valuation.

The types and grades of merchandise to be handled bear directly upon costs and prices. Studies should be made to determine what grades of the various types of merchandise are to be handled. This study should be made, as far as possible, on the basis of the physical quality of merchandise. The price for which the same or similar goods are sold by other stores is an important item for consideration. Another objective of a merchandise study is to lower prices and to improve quality for the prices asked. The concern is entitled to larger profits for the forethought exercised, and this is the main purpose of the concern in making the improvements. Its financial ability to make any reasonable change should be understood thoroughly before the plans for improvement are formulated.

A time and route study should be made for the purpose of eliminating congestion centers. Studies for ascertaining the time taken by customers in inspecting merchandise, in making purchases, and in passing along should be made. An index of the rate of flow of customers in the store should be ascertained for each hour of the day and each day of the week for the seasons of the year. The route study may be made from cases obtained in the store and supplemented by studies of the family budget.

The Apportionment of Merchandising Effort.—Another important factor in merchandising to which little attention has been directed is the scientific determination of the most economical combination of the principal divisions of marketing effort. The question of how much to spend for each phase of marketing is usually a rule-of-thumb process. The same is true of sales effort. One of the great wastes in marketing effort, though not appraised, is to be found in

the lack of a well-coordinated marketing program based on scientific analysis. Millions of dollars are spent for publicity to get customers into a store only to have them become disgusted with the sales service and walk out. On the other hand, excellent sales service awaits people who would patronize a store if they were appealed to by proper publicity. This means that if the most economical quantities of effort are to be determined for marketing, scientific analysis must supersede rule-of-thumb methods, and marketing policies must be based on such analysis.

In making a study of marketing problems it is necessary to secure more data than could be obtained from internal records, and it may be easier to secure adequate statistical data by gathering it by the method of sampling without analyzing vast quantities of data. An evaluation must be made of the other phases of the business to ascertain the probable failure to cooperate, and the probable loss from these sources. To illustrate: the credit department may refuse to grant credit to or may offend prospective patrons who have been appealed to by publicity, sold by the sales force, but the transaction is terminated by the credit clerk or by the customer. Unless all service departments are thoroughly acquainted with the marketing policies of the concern, the marketing efforts will fall short of possible attainment. These factors should be considered in making an apportionment of marketing effort.

CHAPTER XV

ACCOUNTING AS AN AID TO THE SALES MANAGER

Direction and Coordination of Sales Activities.—Direction is a broad function which is exercised by all managers. This does not mean that they have a free hand in planning and in performing, because this would be contrary to the principle of “separate the planning from the doing” and other principles of organization. The sales manager, however, must exercise several kinds of direction. He directs the activities of the sales function of the organization so that they conform to the plans and policies of the business. He does considerable planning, too, as discussed below.

The coordination of sales activities comes about largely by budgeting. The carrying out of the budget, however, requires much direction. Executive action is often needed from day to day in order that plans may be executed properly. This requires a constant balancing of sales activities with the activities of other departments. Coordination is a day to day, week to week, month to month, and season to season problem. That is why the several functions require executive direction and coordination.

Sales Management Studies.—The study of sales performance in comparison to plans is an important function of the sales manager. Such a study enables the sales manager to know where executive action is needed and the probable extent to which it is needed. For example, the decrease in sales of a certain commodity may be studied for the purpose of ascertaining the probable cause for such sales decline. This furnishes a sound basis for executive direction.

An important function of the sales manager has to do with salesmanship. By salesmanship we mean the science of and the art of selling. To perform this function in a scientific manner, the sales manager must make extensive use of accounting. Many phases of the science of salesmanship have been discovered, but much remains to be done by the individual enterprise in this direction. For best results, the art of salesmanship should be preceded by the mastery of the science of salesmanship. Many enterprises have found that salesmen

who have been taught certain principles of selling soon acquire a better art of selling than those who do not have such training.

The strategy which a sales manager uses will have much to do with his effectiveness in direction. The development of the most effective strategy will depend greatly upon the adequacy of the accounting methods employed. By sales strategy we mean the ways and means by which favorable results can be secured. The sales manager makes use of much data prepared by other functions in formulating his plans for action. These plans are the ways and means by which he hopes to secure results that he has agreed to secure.

Counsel and Inspiration.—An important function of the sales manager is that of furnishing a source for counsel and for inspiration to those who perform the sales function. In a sizable concern, the sales manager should spend a considerable part of his time with those who have actual supervision of the sales forces. In a large organization that has sales branches, the sales manager may devote his attention to the management of the branch sales managers. The functions of the sales manager, however, are the same whether the business is large or small.

The sales manager can make extensive use of accounting information to serve as a basis for the counsel of and inspiration of others. The counsel and inspiration that make for stable business must be based largely upon facts. An intelligent salesman soon learns to detect artificial inspiration. The customer does too. It is of an inferior quality because facts are obtainable from which rational persons may be inspired as well as others. Facts disclosed by proper accounting may serve as a base upon which the sales manager erects his opinion, in the counsel of those under his direction. This may be made clearer by an illustration. A salesman was ready to resign because his business had fallen off considerably and his bonuses had stopped. The sales manager was able to show him: (1) that sales were on the decline in conformity to general business conditions in the industry; (2) that salesmen in territories of a like rating were no better off than he; (3) that the decline was likely to be of a temporary nature. Many other examples could be cited if space permitted.

Committee Work.—The sales manager is the source of important information relating to sales performance in connection with committee work. Proper accounting records should yield most of the information that managers possess, but this information is not always available in report form. Specialists in different fields come together

as a committee to decide important matters. The interpretation of accounting information in the light of the new problem is an executive function. Here, dispatch in the presentation and the interpretation of the problem is often important. The sales manager should bring to the committees on which he serves, a well-balanced interpretation of the problem as it affects the sales department.

How accounting serves to aid the sales manager in accomplishing the above functions will be developed after a brief treatment on organization.

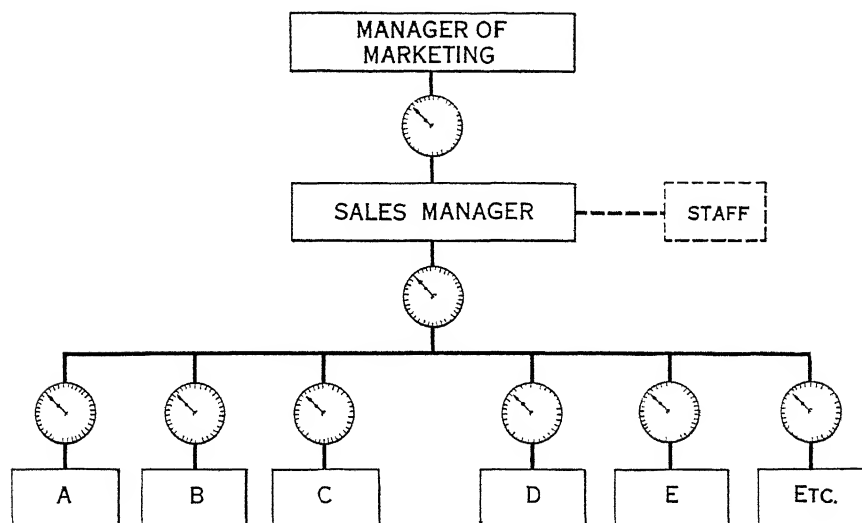


Figure 20. Organization for Sales Control.

Organization for Sales Control.—The manager of marketing, as shown in Figure 20, is the head of the marketing organization. The sales manager is the head of the sales organization. In particular concerns, the work of the sales department may be so extensive that an extensive organization is required to handle the business satisfactorily. In other concerns, the sales personnel may consist of a few salesmen under the direction of a "general manager." For obvious reasons, the development in this treatise must be confined to a treatment of the general principles to be followed. Particular firms may not have a "sales manager," but the function is clearly discernible in business enterprises.

The sales manager, as the executive head of the sales organization, has under his direction the salesmen; as, A, B, C, etc. In a sizable enterprise, he may require a corps of sales executives to do the neces-

sary personal supervision work. While no general rule can be laid down for all types of concerns, it appears that many concerns limit the salesmen that a sales executive can supervise, to from ten to fifteen. In like manner, a manager of supervisors is needed for every fifteen to twenty supervisors. A concern with an average of about one hundred and twenty salesmen has a sales manager and eight "assistant sales managers." The sales manager supervises the work of the salesmen in the home-office territory.

The sales manager may require a staff to perform certain phases of the technical work with which he is not acquainted or for which he does not have the necessary time. The controller should furnish a technician to make special studies. In some cases, these technicians may serve the sales manager for a considerable period.

In a sizable concern a number of clerks who are considered as performing the sales function are sometimes employed in the sales department. This is usually erroneous because they nearly always perform some function under the supervision of the controller. There are exceptions, however, such as the routing of salesmen, the work leading to the acceptance of sales, and other tasks, which belong to sales management. The salesmen who write out sales blanks furnish the accounting department with vital information. Until the order is accepted by the management, usually no sale exists. The record which the salesman makes and the sales manager approves may become the basis for the bookkeeping entry. The point of distinction between functions seems to lie not at the point where the salesman wrote the order but at the acceptance of the sale. Close distinctions are often necessary to establish the basis for proper organization. Functions shade into each other, and for purposes of scientific treatment some distinctions are necessary.

The Budget.—An important tool for the control of the sales function is the budget. The budget which covers the sales function may be divided into (1) the budget of sales, and (2) the budget of sales "expense." For purposes of convenience, these will be referred to as the sales budget and the sales expense budget.

The basic data for the sales budget are to be found in the work of other functions of the business. The setting up of a tentative sales budget by the sales department presupposes a considerable amount of knowledge about the operations of the other functions of the business, as indicated in the previous chapter. In its final presentation to serve as the basis for operation, the sales budget must be set up in units,

prices, and amounts. It should be analyzed according to commodities, and classes of commodities; by minor and by major organization units.

The sales expense budget should be made out in terms of the organization. That is, it should be analyzable into an adequate classification of expenses and asset items for the several units. From this, the budget for every salesman, for every sales supervisor, for every assistant sales manager, and for the sales manager, may be obtainable. This information will serve as a basis for operation.

The sales budget should be arranged into maximum and minimum sales. In fixing the budget, some point between the maximum and the minimum sales will be selected which appears to the management and to the administrators as most desirable of attainment. The sales expense budget should be gone over carefully and the fixed and the variable expenses estimated. Fixed expenses should give adequate consideration to the minimum sales. Variable expenses should show the variability of expenses between the minimum and the maximum sales. It may be desirable to arrange the variable expenses according to a simple classification of the degree of variability. Some expenses will vary with sales while others will not. An equation and a chart may be of considerable utility in helping the sales manager to evaluate achievement.

Achievement Records.—The achievement records must be kept in terms of the budget. If this is not done it will be impossible to review the budgets properly. This applies to the records as a whole. Individual records may be designed for specific purposes. One type of records may keep account of amounts while another may keep account of quantities, prices, or other data.

The sales data may be classified in a wide variety of ways. Basic sales data may be classified as follows:

1. By commodities or departments.
2. By territories or departments.
3. By salesmen.

The lines of organization should be recognized clearly. This implies that not only must the items be carried in total but they must also be analyzable into their component parts; namely, units, prices and amounts by commodities. The classification of commodities according to salesmen provides basic data which may be combined by territories, to reflect the line of control, and these in turn may be combined to represent the major lines of control. The sales expenses should be analyzable along the same lines of control. A simple but adequate

classification of expenses should be provided to meet individual needs. Since the classification of sales data may be somewhat different in specific cases, the basic data alone will be considered.

The budgets and the corresponding achievement records and reports are basic accounting information and form the center of the tools used by the management in the control of sales.

The Standard Task.—The standard task or the quota idea for the sales organization has received considerable attention in well-managed businesses. The value of accounting and the scientific method in attacking this problem are of first importance to a satisfactory solution of the problem.

An important factor in the standard task is that of the valuation of sales territory, which is treated in the following chapter. The sales budget and territory valuation are the most important instruments used by the sales manager and his assistants in fixing standard tasks for individual salesmen. If the preliminary sales budget prepared by the sales department is approved with minor changes, then the changes in individual tasks of salesmen may be changed to correspond.

In some cases the budget may be drawn up on the basis of quantities and amounts of separate commodities for the business as a whole. In this case, the sales manager must fix the several tasks. This may be done for each sales territory by considering probable business conditions in each territory, the territory general valuation, and the budget. Thus a quota for each department or branch could be determined. The assistant sales manager may assign quotas for each salesman on the basis of the territory valuation and the budget. This procedure considers the same factors as the procedure advocated above.

In setting standard sales tasks, it is often necessary to build up a considerable fund of information before much confidence can be placed in quotas. The quota idea is often approached from the viewpoint of stimulating salesmen. Some concerns increase the quota each year without regard to business conditions. This may or may not be an adequate guide. It certainly is not scientific and should be replaced by more adequate basic knowledge, as discussed at interrelated points.

Compensation Plans.—There are three basic plans for compensating salesmen, each one of which is used by business enterprises. Mr. Sample¹ classifies these as follows:

¹“Fixing the Salesman’s Task,” A. M. A. Sales Executives’ Series, No. 27, p. 4.

- (1) Straight salary and expenses.
- (2) Straight commission.
- (3) Salary, expenses, and bonus.

There are a great variety of commission plans, bonus plans, and other plans for paying those connected with the sales function.

The particular compensation plan which any firm may have, may or may not be suited best to its needs. Not only should the accounting information furnish the management with specific information about compensation due, but data relative to the effectiveness of the plan should be made available for use. This implies that more than one plan of compensation is tried by a firm or that they have records from other firms. It is often possible to predict quite accurately the effect of a change in the plan of compensation from a knowledge of the factors involved in its previous success.

Straight Salary and Expenses.—The whole idea of sales budgets, territory valuation, and the quota are closely related to compensation. These instruments emphasize the necessity for a compensation plan which will secure the proper cooperation from the sales force. While the compensation plan is not the only force involved, it is undoubtedly a dominant force in the sales function.

In a business that requires more or less "missionary work," the salary and expense form of compensation may appear to be the only fair basis for paying salesmen. A firm that goes to the expense of establishing a comprehensive control plan must give this question due consideration. It is difficult to see how a concern could get best results by this form of compensation. They may set a dead-line for each salesman below which he must not fall. The difference between the dead-line and a reasonable quota is far enough to cause a large loss to the firm. The question is of enough importance to justify an adequate study of the factors involved in the particular case.

Straight Commission.—The commission form of compensation is used for a large variety of purposes. The treatment here is from the viewpoint of the quota. What was said about the salary and expense form of compensation is applicable to this form of payment. The salesman who works for a commission usually feels that his time is his own to use as he pleases. A commission form of payment is usually considered as equal payment for equal effort, while selling is not looked upon in that manner. The salesman is encouraged to seek the business that comes the easiest. This tends toward a wide but spotty distribution, which is usually uneconomical. The energetic

salesman may refrain from his best efforts for fear of having his rate of commission cut. These and other factors may work to cause the management to secure faulty conclusions as to sales possibilities of their products. Any comprehensive study of the budget should give careful thought to the commission form for paying salesmen, if it is desired to maintain this form of compensation.

Salary, Expense, and Bonus.—This type of compensation is best adaptable to a comprehensive budget type of control. It may be constructed to serve a wide variety of purposes. It appears to be capable of doing more than either of the foregoing forms of compensation. The amount of sales set for the dead-line and a given percentage may be used to compute the salary and expense factors. The bonus may be graduated in such manner that the salesman will have sufficient incentive to exert his best effort to reach the quota set for him, or to exceed it, if desired.

The Selection of a Compensation Plan.—The accounting method may be used effectively in the selection of a plan of compensation that is adaptable to the best interest of a given enterprise. That is, a plan which secures the firm a close approximation to predetermined results carefully evaluated. It should determine the amount of and the gradations in the compensation necessary to insure the distribution evenly. Such results, however, depend upon a prudent use of adequate accounting methods.

A fund of information may be collected in a few seasons that may assist greatly in the selection of a fairly scientific compensation plan. The length of time required will depend largely upon the value of previous records and the tools used by the management.

There are three principal factors involved in the selection of a plan for compensating salesmen. They are as follows: (1) the productivity of the salesman; (2) the base pay; (3) the differential.

The productivity of a salesman may be measured by sales or by gross profit. These are interdependent problems. A salesman is not wanted to sell a large pecuniary amount of goods but to "sell the line" at the prices asked. In specific cases, the interest of the firm may be served well by encouraging sales in dollars, or in gross profit. In a well-conducted enterprise, however, either of these factors is incomplete if due consideration is not given to the "line" as a whole. The compensation plan, therefore, should encourage balanced sales.

The base pay of a salesman is used here to include a minimum salary and a traveling expense adequate to secure these sales. The

minimum and the maximum sales for each territory is established by research methods. This should place each salesman upon an approximate sales equality with one another. That is, each salesman should have an equal chance with every other salesman to secure his minimum or base quota, as well as his maximum quota.

The productivity of salesmen should be divided into a minimum and a variable quota. The differential factor covers the bonus pay and the variable expenses. A number of factors must be considered in determining the bonus plan for salesmen. Typically, these consist of the following: (1) the minimum gross profit; (2) the base pay; (3) the sale of a balanced line; (4) the maximum gross profit; (5) the net operating profit per salesman; (6) the differential itself; (7) the earnings of salesmen in other firms; (8) several personal factors. Some of these personal factors are here given: a desire to represent a stable or well-favored business, a desire to work under the management, a desire to stay with one firm, a contest of one kind or another, and many other factors, all of which have negative as well as positive phases. Because of the difficulty in their evaluation, personal factors are not considered here. The particular bonus plan itself is a subject for research and experiment with the several factors mentioned above.

Testing the Effectiveness of the Bonus Plan.—A considerable number of bonus plans are used in practice. The bonus plan may or may not be effective in securing the results desired. The gradations in a bonus plan are usually recognized as having considerable to do with the success of the bonus.

The effectiveness of the gradations in the bonus plan may be tested before standard ratios are approved. Suppose that a minimum and a maximum sales quota be determined for each salesman. Suppose, further, that it is decided tentatively to have five gradations in bonus. These may be distributed on an arithmetical, geometric, or some other basis, so that in either case the total payment will be approximately the same. The payment for different degrees of sales achievement, however, would not be the same on different bases. The effectiveness of the bonus may then be tested by experiment. If no salesman earned a bonus, this is conclusive that the bonus is not effective, since it is assumed that the minimum sales quota is set properly. Correspondingly, if all salesmen earn a maximum bonus, it is 100 per cent effective. If a record be kept of the performance of salesmen from month to month, a study of the data can be made to determine the effectiveness of the bonus.

In the above case, the study should disclose the most important statistical measures of the data. The arithmetical mean would indicate that one-half of the salesmen earned a given bonus percentage. If one-half of the salesmen's pay reflected earnings in the highest bonus gradation, the conclusion may be drawn that the bonus plan has a stated amount of effectiveness. It should be emphasized, however, that the assumption has been made that sales effort can be measured by a bonus plan and that the data used are homogeneous and fairly stated. The scientific method should be employed in securing the data, however, if reliable results are to be obtained. A standard bonus plan should be the outcome of this type of analysis.

Sales Management Reports.—The principal accounting reports used by sales management may be classified as budget and as performance reports. Each of these types of reports may be further classified into reports of sales and reports of sales expenses. This discussion will be limited to certain phases of these basic reports.

Since the budget is the basis for operation it is obvious that achievement should be compared with the budget. This is too often forgotten in practice. For example, one company budgeted a 40 per cent increase in sales for one year over the previous year. Despite the fact that the achievement for the budgeted period was better than 39 per cent over the prior year, the accountants and officials still compared the achievement of one year with that of the prior year. This seems strange because there appears to be no real comparability between the two statements. From the management viewpoint, the only true basis for comparison is that of the budget and the achievement. Where there are only slight variations in the budgets and in the achievement, from year to year, the comparison of achievement with achievement may not appear so erroneous. This comparison, however, is faulty because two periods usually have important differences even if the net results are the same. This comparison should not be made except to satisfy a desire for a refreshed memory on comparative business history.

Sales Reports.—An important summary report for the sales manager is that of the budget and achievement report of sales. Table 24 shows such a comparative report for the X Manufacturing Company. The report shows the budget set for each salesman and his achievement stated in units, prices, and amounts. The comparison of the budget is shown by the increases and decreases. The causes for variation are analyzed into units and prices. Observe that, while performance was in excess of the budget in the amount of \$1,437, yet the posi-

TABLE 24

A COMPARATIVE REPORT OF BUDGET AND ACHIEVEMENT SALES OF THE X
MANUFACTURING COMPANY

Salesmen	Units	Budget		Units	Actual		Increase Decrease*
		Price	Amount		Price	Amount	
Story.....	2980	\$5.25	\$ 15,645.00	3040	\$5 24	\$ 15,929 60	\$ 284 60
Griffin.....	2670	5.25	14,017.50	2710	5 27	14,281.70	264 20
Snell.....	3050	5 27	16,073.50	3040	5.27	16,020.80	— 52 70
Dickson.....	3260	5.30	17,278 00	3770	5 31	20,018.70	2,740 70
Redd.....	3400	5.32	18,088.00	3050	5.30	16,165 00	— 1,923 00
Holloway...	3720	5 22	19,418 40	4310	5 20	22,412.00	2,993.60
Moore.....	4050	5.20	21,060.00	3470	5.22	18,113.40	— 2,946 60
Veteto.....	4070	5.23	21,286 10	4260	5.25	22,365.00	1,078 90
Noble.....	3540	5.27	18,655 80	3120	5 25	16,380 00	— 2,275.80
Teague.....	3260	5.22	17,017.20	3290	5 20	17,108 00	90.80
Middleton..	4500	5.24	23,585.50	4640	5.34	24,767 80	1,182.30
Total.....	38500	\$5.25	\$202,125.00	38700	\$5 26	\$203,562 00	1,437 00

Salesmen	Units	Due to Units		Units	Due to Prices		Net Variation
		Price	Amount		Price	Amount	
Story.....	60	\$5 25	\$ 315 00	3040	\$— 0.01	\$— 30.40	\$ 284 60
Griffin.....	40	5.25	210.00	2710	.02	54.20	264.20
Snell.....	— 10	5 27	— 52.70	3040	.00	— 0—	— 52 70
Dickson.....	510	5.30	2,703.00	3770	.01	37.70	2,740.70
Redd.....	— 350	5 32	— 1,862.00	3050	— .02	— 61 00	— 1,923 00
Holloway....	590	5 22	3,079 80	4310	— .02	— 86.20	2,993 60
Moore.....	— 580	5.20	— 3,016 00	3470	.02	69.40	— 2,946 60
Veteto.....	190	5.23	993 70	4260	.02	85.20	1,078 90
Noble.....	— 420	5.27	— 2,213 40	3120	— .02	— 62.40	— 2,275.80
Teague.....	30	5 22	156 60	3290	— .02	— 65 80	90 80
Middleton...	140	5 24	733 50	4640	.10	448 70	1,182.30
Total.....	200	\$5 25	\$1,050.00	38700	\$ 0.01	\$387 00	\$1,437.00
Variations....	1560		\$8,191.70			\$695 20	\$8,886 90
Variations....	— 1360		7,144.10			305.80	7,449 90

tive variations were \$8,886.90 and the negative variations were \$7,449.90. The sales manager should be interested in studying these variations further to determine the effective causes for the variations. On the face of this summary report are to be found some interesting facts for the sales manager. For example, Redd and Holloway each cut the price two cents per unit, yet the former fell short of his budget quota by 350 units, while the latter increased his units by 590. Salesman Moore raised his average price two cents but fell short of his

budget quota by 580 units, while Dickson increased prices one cent and sold 510 units over his budget quota.

A study of the underlying data in the above case will enable the sales manager to rate the salesmen in an equitable manner. The underlying reports which the sales manager should receive will differ somewhat in different cases. The basic data, however, should be available in units, prices, and amounts, by salesmen, by commodities, by territories, and by other basic classifications, for budget and for performance. This will enable the sales manager to attack his problems in sales in a scientific manner.

Sales Expense Reports.—The sales expense reports should be drawn up so that a comparison can be made between the budget and performance. These reports should cover a standard classification of accounts and be analyzed into the several organization units. The type of analysis required for each organization unit will depend upon the requirements of the particular case. Where traveling salesmen are employed, for example, it may be desirable to know the items of expense for each salesman. A comparison of the budget and achievement reports, and an analysis of the effective causes for variation will be of considerable value to the executive in the control of expenses. In cases where it is not feasible to develop records which will show effective causes for variation between the budget and performance, the significant variations may be analyzed and the effective causes for variation determined, if the original records are properly devised and kept. If the budget and achievement are approximately the same, little of value to management will be secured usually from the analysis of causes for variation. In practice, it may be advisable to confine the analyses of effective causes for variation to stated percentage variations between the budget and achievement. This is true only where the causes for variation are approximately the same. That is, the factors at work on the data should be approximately the same and be understood.

Accounting as an Aid to Prudent Sales Policies.—The broad policies of a business should be made by the policy corps. The executives interpret these policies to the general public. The achievement of the executives in the interpretation of the policies of the enterprise should be recorded properly and studied carefully. The policies that the sales manager is asked to interpret find expression in the budget. In most cases, the sales manager will have an opportunity to influence

the budget preparation. In this he has a fair opportunity to interpret the general policies.

The sales manager may make extensive use of accounting to test not only the policies of the enterprise but also his plans for effecting them. There are many kinds of sales policies so that this discussion will be limited to (1) the service policies, (2) the goods, and (3) the particular business.

Many business executives have learned that they are selling service, and not "brick and mortar" or so much machinery. There are many ways that accounting can be used to point out the defects in sales service. It is often difficult to secure adequate data on sales service because the customer does not always complain—to the company. Accounting methods may be employed which will show the management the chief reasons why the goods themselves and the service are defective. Two illustrations will show how accounting may be made to disclose information in regard to service in salesmanship. A calculating machine company had extended its business moderately but found that competing machines were making greater progress. An analysis of customers who had purchased machines disclosed that comparatively few reorders were received. A representative list of customers from whom reorders should have been received was canvassed. The record showed that the office employees were not able to adjust the ribbon, which got out of position when the machine was subjected to hard treatment. Proper sales service helped the situation immediately. The records of an oil company disclosed that some important customers were consuming larger quantities of their products than other customers who had similar facilities. This led to an investigation which showed that many of their customers were wasteful in the use of their products. An engineer was used to prescribe the amount of product necessary for each plant.

An important phase of business policies relates to the goods or services. The quality has much to do with salability. Accounting may be used in many ways to test the quality of goods. Quality means adaptability or service quality. Many illustrations of this are available. A storage battery manufacturer sold large quantities of a certain type of battery. Many complaints were received in a short time. The model was discontinued. The battery did not give good service in use. A book company published a book and bound it in two grades of binding. It was advertised for sale and priced so as to allow for the difference in the grade of binding. The recorded sales showed that

over fifty times as many books in the better binding were sold than of the other binding.

Most large concerns have established distinctive sales policies. Their effects upon the business are often hard to evaluate. In many cases accounting methods may be used for this purpose. For example, "we sell for six per cent cheaper" is a distinctive sales policy that is hard to evaluate. A policy, however, like "we sell on the installment plan," may find ample accounting data to show the probable effects upon the business.

In most cases there are a number of policies involved, and if each policy is to be evaluated, the probable effect of each policy should be segregated for study.

Selling Methods.—In the previous chapter the questions relating to the more general phases of the scientific analysis of marketing problems were discussed. The discussion of the problems which relate more directly to sales, and reserved for treatment here, are:

- a. Best channels for selling particular goods.
- b. Which goods need special salesmen.
- c. Which goods can be sold best in groups by a salesman.

The ascertainment of the best channels for selling particular goods is a problem for scientific study. The word "channels" is used here to mean ways and means of selling. For example, is it more economical to sell the goods by mail, by house to house call, by selling through jobbers, factors, or agents, by selling through retail stores with or without close supervision and selling aids? The executives of many businesses think that the channels of distribution open to them are limited to those which they have tried. There are, however, always good possibilities in untried channels. The large department store, for example, has found that profitable business is obtainable through the mails; even to customers within a few blocks of the store. The possibilities of new channels and new methods in selling should be tested for discovering ways and means for making savings in marketing costs.

The performance records of sizable concerns may be made to yield valuable marketing information regarding specific goods and specific salesmen. Some concerns have studied the performance of salesmen and have found that the better salesmen sell twice to four times as much goods as the average salesman on the job. The conditions are apparently the same. This emphasizes the importance of a careful selection of salesmen to sell specified goods. Some salesmen are more successful

in selling some goods than they are in selling other goods. Some goods require more salesmanship than do other goods. This emphasizes the importance of studying merchandise and salesmen for the purpose of finding which goods can be more profitably sold by special salesmen and which salesmen can be used most profitably in selling particular goods. A job and time study of the salesman may disclose other important features of the specialization in sales effort. It may be discovered which salesmen and which merchandise lend themselves most profitably to different degrees of specialization. In some cases, for example, it may be more profitable to have salesmen standing idle than doing certain phases of work connected with selling. The gain would be tremendous if salesmen could be kept busy at the things they can do best. Such a result is the reward for the proposed study.

The combination of articles which can be sold best by a salesman is a subject for scientific inquiry. This is also a study of the degree to which specialization is most profitable. The more items a salesman has, the less time and energy he has to devote to each item. The analysis of the sales of salesmen who have hundreds of items to sell frequently shows that there are definite tendencies toward specialization in a relatively small number of the items. The different commodities should be studied to determine which lend themselves most profitably to groupings of one kind or another. The sales territory, the manner in which the salesman spends his time, the costs, the sales, and the profits, among other special factors, must be considered in making such an analysis. The solution to complicated sales problems will change from time to time, but such changes can be made with precision only where adequate records are kept in terms of expectancies and an evaluation made of the causes for variation.

CHAPTER XVI

ACCOUNTING AS AN AID TO THE PUBLICITY MANAGER

The Functions of Publicity.—There are several important functions performed by publicity in business. Some of the most important of these functions, as related to accounting, are as follows:

- (1) To inform customers and prospective customers of the goods or services rendered by a business or an industry.
- (2) To create in the prospective customer a desire for the goods and to cause customers to continue or to increase the consumption of the goods, and
- (3) To create a friendly attitude toward the business.

It is often impossible to distinguish between publicity and selling, as the two activities are so closely interrelated. The very best kind of publicity is to be found in proper personal contacts, though a considerable amount of this activity may be classed as selling. The salesman who calls upon a prospective customer is usually classed as performing a sales function; however, a considerable amount of strictly publicity work may be necessary to make a sale.

There are many ways by which prospective customers can be informed of goods. Modern advertising carried on by means of newspaper, periodical, special letter, and other forms of "advertising" is only one of a number of important ways of securing publicity. The personal recommendation is a valuable way for securing publicity of a highly valuable character. This type of publicity, if unfavorable, may offset almost any amount of publicity carried on by a concern. Certain brands of automobiles, for example, have not secured wide personal recommendations from owners and sales have been diminished greatly as a direct result.

There are different kinds of publicity used in securing a friendly attitude toward the business. This publicity is usually directed to owners, employees, customers, and the general public. Considerable emphasis has been placed upon publicity of the internal affairs of corporations. Mr. Lamont¹ recently emphasized the advantages to be

¹ *Industrial Management*, July, 1927.

derived from the publicity of the internal affairs or conditions of industrial enterprises. This phase of publicity is developed in Chapter XXIII.

Every official of an enterprise is engaged in some kind of publicity, and this should be carried on in cooperation with the publicity manager. For example, the progressive employment manager is interested in creating in the desirable employee an earnest desire to continue his relations with the business. How this can be done best is a subject about which the publicity manager should be consulted.

Functions of the Publicity Manager.—The publicity manager occupies the same relationship to his function as does the sales manager to his function. The differentiation of the sales and the publicity functions has caused considerable diversity of opinion as to where each particular phase of the work should be done. In some businesses the publicity department dominates all other phases of the work. The same may be said of other departments. The question is, however, one of function. In a well-organized business the many functions must be grouped into closely related groups, if proper control is to be maintained.

The functions of the publicity manager are closely related to the functions of publicity itself. As an executive, he directs and coordinates the publicity activities of the business. He must be a student of markets, marketing methods, and publicity methods. He also serves on committees and acts as a counselor for those under his direction. To perform these functions properly, he must interest himself in the ways and means for carrying these functions into operation.

Organization for Publicity Control.—As in all other phases of management, the publicity manager must be assisted by a corps of assistants. He is responsible to the manager of marketing, who, in turn, is directly responsible to the chief executive. The assistance that the publicity manager requires will, of course, be governed by individual conditions.

The publicity function is composed of a number of constituent parts. In a sizable concern these functions may be grouped into the following:

1. Space Department.
2. Art Work Department.
3. Direct Mail Department.
4. Catalogue Department.
5. Sampling Department.

6. Dealers' Aid Department.
7. Poster Department.
8. House Organ Department.
9. Research Department (under the controller).

The work to be performed by each department should be defined clearly in the standard practice instruction book.

Interrelationships in Marketing Research.—The consumer is an important link in the business chain. If the business chain is not linked securely to the consumer, there are grave possibilities of the individual firm being cut off. The consumer must be willing to pay the price asked for goods and to consume a reasonable amount of them. Research and experiment must be carried on to ascertain how much of a product the public will consume under several conditions, which are customarily summarized in price.

Research plays an important part in the marketing function. To a considerable extent, all of the types of research are closely inter-related. The interrelation between research and publicity seems to be closer than does research and any other marketing function. This interrelation should be kept in mind clearly in the present discussion.

Publicity Research and the Advertising Agency.—Publicity plays an increasing part in modern marketing. Progressive advertising agencies were responsible largely for the scientific approach to the publicity problem. The success of the reputable advertising agency was closely tied up with the success of firms which it represented. It was not enough that the advertiser secure beneficial results from advertising. The agency had to present data which would show tangible results and potentiality. In his quest for such information, the agency took up research by the scientific method. The agencies soon learned that much money was being wasted in advertising. They began to apply research methods to lessen these wastes and make their work more effective. Reputable agencies now make research a condition precedent to advertising.

A manufacturer of ladies' lingerie approached an agency for the purpose of selling a silk garment at a moderate price. The research and analysis convinced the agency that it was not a feasible idea at that time. Finally the manufacturer was induced to drop the idea. It appeared to another manufacturer that there would be a tremendous demand for ladies' lingerie in the cities if they could be sold at \$1.50 per garment. After a good deal of consideration by the management, it was decided to start on the venture in a big way and to beat com-

petitors into the market. In less time than six months the concern had lost over one-half million dollars and was declared bankrupt.

Publicity Research.—A scientific approach to the publicity problem leads to the consideration of every important phase of the business. The following is an outline of a survey which shows the general nature of the problem:

A. Study of product and industry.

(1) Analysis of product and its competition to obtain:

(a) Technical information:

(x) Regarding design, materials, actual and possible uses, appeals, and adaptability of product to needs of consumers.

(y) Regarding the type, styles, uses, and appeals of competitors' product.

(b) Practical information:

(x) Regarding the practices of competitors and their business morality.

(y) Regarding the publicity activities of competitors.

(2) Analysis of the consumer market to ascertain:

(a) The extent and location of the market.

(b) The effects of units and prices on the market.

(c) The habits, prejudices, customs, and other traits of customers.

(d) The probable division of business among the several producers.

(3) Analysis of distributors to ascertain:

(a) The location of the channels of distribution.

(b) The habits, prejudices, and customs of the distributors.

B. Study of the organization, policies, and operations of the enterprise.

(1) Organization.

(a) Type of industry.

(b) Position in the industry.

(c) Financial history and present position.

(d) Internal organization.

(2) Policies.

(a) General and special policies as they affect the conduct of the business.

- (3) Productive capacity and ability of the enterprise.
 - (a) Physical facilities.
 - (b) Raw materials and their markets.
 - (c) Personnel.
 - (d) Output, present, past, and prospective capacity.
 - (e) Standard costs.
- (4) Sales capacity: past, present, and prospective.
 - (a) Physical units and prices.
 - (b) Sales costs analyzed.
- (5) Sales strategy and technique: past, present and prospective.
 - (a) Training of sales force.
 - (b) Wage payment plans and incentives.
 - (c) Use of organized publicity.
- C. Study of publicity ways and means.
 - (1) To determine the nature of the ways and means that may prove successful.
 - (2) To evaluate the results to be secured from different publicity plans.
- D. Preparation of the master, major, and minor budgets.
 - (1) To evaluate the result to be secured by each phase of the business.
- E. Study of budget, achievement records, and the causes for their variations.
 - (1) To assist in the survey of the past and to assist in future planning.

This outline indicates the principal factors that should be considered in publicity research. There are, of course, many interrelated problems, but these several factors must be evaluated before the nature and extent of the publicity can be determined. The nature and extent of the publicity is very vital to business planning. In order to secure the most favorable results from publicity, all of the factors of the business should be in harmony. A poor labor policy, for example, may greatly reduce the effectiveness of favorable publicity. Capable research and analysis are necessary to find out all the facts that should be considered in deciding and formulating a progressive publicity policy. The ultimate object of such a policy is to increase the profitableness of the enterprise. To do this, it may be necessary to get more of the total business already done or to get a larger share in an increasing market, or to create new markets.

Because of the wide range of the scope of publicity research, only certain phases of the subject will be treated in this chapter. The interrelated parts are treated elsewhere.

Study of the Product.—The study of the product in relation to other products of a similar or competitive nature is important at the outset. It seems self evident that a product must be suitable to the needs of the customer. This, however, is not the case. A thorough analysis and test of the product is usually quite essential.

Many manufacturers have thought that they had a very good product until it was given a critical study by research methods. This may be emphasized by means of illustrations. A manufacturer of farm tractors found that several types of wheels were necessary if tractors were to be sold over a wide area. He found that different sizes of engines were necessary to do the same type of work in different areas, and that the engines and equipment must be easily turned around in a small space. A hair tonic manufacturer found that his container would not fit into the consumers' medicine case. A vacuum cleaner manufacturer found that a few simple devices attached to his machine would make it have many more uses and a much stronger appeal. The analysis of competing products enabled a manufacturer to find that a competitor had a better product than the one he expected to advertise widely. The search for appeals revealed to an advertiser that a large percentage of buyers had not bought on the strength of the appeals made, but for other reasons. The use of these new appeals increased the sales considerably. The right product and adequate knowledge about it is a condition precedent to prudent publicity.

Extent and Location of the Market.—Research and analysis keep revealing the fact that many business executives do not have a clear idea as to the nature, location, and extent of the market for their goods. The publicity function cannot afford to proceed on supposed information. They must have the facts and they must have expert opinion to interpret those facts.

In many cases, the location and the extent of the market for goods may be measured with a considerable degree of success. The method of attack is that of scientific analysis; consequently, the specific factors which affect each case may be somewhat different. A convenient procedure is to construct an index of purchasing power. Purchasing power is often interpreted to mean a flow of income which may be used for making purchases. Other factors than income affect purchasing power, for the necessary funds may be borrowed or invested with

which to make payment. For purposes of this discussion, purchasing power will be used to indicate the factors which seem to influence the purchase of particular commodities.

The subject may be approached by determining the degree of similarity that exists between income, for example, and effective desires which result in the sale of goods. The study of income distribution is a subject for research. The effective desire for different goods is usually different. If income alone furnishes a good index of purchasing power, it is essential to determine the relationship between these desires and income.

The General Motors Purchasing Power Index is a good illustration of an effort to measure the extent and the location of the market for their product. It contains several classes of weighted data. Those who are interested should refer to *Manufacturing Industries*, Vol. XI, p. 291.

This study is of a somewhat general nature. It tells where the goods may be sold and the probable extent to which they can be sold. Other factors enter into the problem. Some of these are discussed below.

Effects of Units and Prices on the Market.—As indicated previously, the study of the market involves a study of units and of prices. Before extensive publicity of a product is undertaken, a knowledge must be had of the probable number of commodities that can be sold at particular prices and the localities where these products may be sold. The location and the extent of the market is often affected greatly by prices. For this reason, the question should be studied carefully.

In many cases, a more or less definite relationship may be determined for units and for prices. This is true where the market is wide and the transactions are numerous or where custom largely dictates price. The modern tendency is toward price stability. The approach to the problem may be made by figuring the unit consumption that may be expected under two or more prices. The other principal phases of the problem have been discussed in Chapter XIV. Whichever price seems to interpret the company's policies best should be established.

The Habits and Traits of Consumers.—There are a group of strictly personal factors that affect consumers. It is usually a hard task to change the habits, prejudices, customs, and other traits of customers. For example, more than one company completely failed in their efforts to get people to accept a breakfast food. In research work there are always possibilities of securing a sample of cases which

are not representative cases. Nationality, race, and religion have much to do with the successful marketing of many products.

The researches should reveal the features of the product that may be objectionable to many people. These features should be removed, as far as possible, and due consideration given to those which remain in making preparation for publicity.

Division of the Total Business.—It is desirable to know the division of the business among the several producers. This is true particularly in the case of manufacturers of competing products. The principal factors which should be considered in making this division are past achievements duly weighed to provide for anticipated growth. These data may be secured by research and evaluation.

In many respects the division of the business may serve to gauge the progressiveness of the enterprise. Many businesses are very much interested in knowing their position in the industry. Progressive oil, automobile, tire, meat, and many other companies use the division of business in the various territories to gauge and to apportion their marketing efforts.

Territory Valuation.—The division of the total business should take place along territorial lines. This leads to a valuation of the several territories. The basis for this valuation is the same as for the total valuation. Sometimes it may be preferable to build up a total valuation from the valuation of territories. The quota is a convenient means for expressing territory valuations. In making such valuations Mr. H. G. Weaver¹ says that a good slogan is: "better be right than simple." Territory valuations are used in sales work, too. Such valuations are required by the publicity manager for a variety of purposes. They serve as a basis for the apportionment of publicity effort and for selecting the publicity ways and means for each territory.

Proper publicity may reduce greatly the salesman's effort. A study of the results obtained from advertising has demonstrated that an evaluation may be made, based upon scientific facts, to determine the proportion of publicity and of salesmanship required in the several territories to secure predetermined results. The most economical proportions of these two classes of effort may be used to decrease marketing costs.

Territory valuations are also made for the purpose of determining balanced sales. Balanced sales are determined by studies in several

¹ "Territorial Market Analysis," Sales Ex. Series, No. 32, A. M. I. A.

phases of management and administration. The several factors will be determined and controlled largely by the general policies of the individual enterprise. An illustration of balanced sales is that of a manufacturer who makes fifty-odd varieties of products for table consumption. A study of the family budget for groceries and the family diet enabled the manufacturer to determine, for each territory, the probable amount of money that could be expended for products similar to his varieties. Another study pointed to the proportion of the business which he secured. A study of past sales disclosed the consumption of each product by territories. A study of sales and publicity effort by territories disclosed important relationships to past sales. Another study used the above information, together with information about production facilities, profits ideals, and costs, to determine quotas for each product. A simpler case is that of a manufacturer who sells a group of standard products that are used together. If the sales for each product do not approximate a standard consumption, the sales are not balanced.

The Analysis of Distributors.—An important phase of publicity research has to do with the study of distributors. There are a number of classes of distributors. The jobber, the wholesaler, and the retailer form a common chain of distributors. The researches should determine the kind, location, and extent of each class of distributor that may be expected to help distribute the product, or, in some cases, to use the product.

The study of distributors in conjunction with that of consumers may provide much desirable information for management use. The density of wholesalers and retailers compared to population and to purchasing power, for example, will provide information that may be used to determine the approximate number of wholesalers and retailers in each territory that may be required to effect the desired distribution.

Where possible, the study of distributors should be carried on so as to place all distributors on a somewhat comparative basis. If they can be analyzed by sales groups and financial ratings, these data will be of great value in setting quotas, and these in turn affect publicity. These types of data are not usually easy to obtain. A study of the family budget, the sales of retailers, and the sales of particular commodities may do much to assist in the solution of marketing problems. One manufacturer used such a study to determine weak spots in his distribution. A full development of this topic would require more space than can be devoted to it in this treatise.

Publicity Ways and Means.—A study of the factors indicated above should show the market that is to be reached. These several factors must be studied with due regard to the interrelated problems. These studies will show where the consumer to be reached is located. Research should be engaged in to determine the most desirable ways and means of reaching the consumer. This will include a study of the following:

- (1) The amount of money needed, or the budget, and
- (2) The media to be used.

The determination of the amount of money needed is usually based upon past experience: previous sales or previous expenditures. This is not a scientific basis. The question is: how much money will be required to secure the publicity necessary to obtain the budgeted sales and increase the prestige of the business? This is not usually a question that can be settled on the basis of past records. It is often difficult to get any data that will show a definite relationship between the sales and publicity expenditures. Proper research methods and study have been known to find such a relationship in certain businesses. The publicity manager should be expected to predict definite results to come from the expenditure of the money his department spends.

An adequate knowledge of the market and the media by which the market can be reached is a condition precedent to the setting up of a proper budget. This is likewise a subject for research and for analysis. Publicity is obtained by different methods of communication. A circular letter, the printed page, personal interviews, recommendations, displays, sample methods, and many other ways of communicating about goods are different forms of publicity. The publicity manager should ascertain which of these methods of communication are required to secure the desired results in the most economical manner.

The Need for Publicity Standards.—Despite the fact that billions of dollars have been spent in publicity and advertising, there are as yet few phases of the work which have been subjected to scientific investigation. A large measure of this lack of investigation is due to the fact that results are wanted, and if favorable results are obtained the business man does not stop to analyze the reasons for success, and if a failure results, few executives realize the value to be derived from the study of the failure. Then, too, few firms have sufficiently trained staff men to make the necessary scientific study for the setting of publicity standards.

The executive is faced with the question: how much can be most profitably spent for publicity of certain goods? He cannot answer the question unless standards be provided. The usual practice regarding the amount which can be spent profitably for publicity is strictly a rule-of-thumb process. It is experimental, and no means are provided to assist the executive in deciding whether or not the results secured justified the expenditure made. Since no adequate methods are provided for the study and interpretation of the experience, the executive is usually unable to tell whether publicity creates a larger demand for goods or whether it pays.

Mr. C. D. Garretson¹ says:

If you say that advertising is too complicated or too intangible to be subjected to accurate, scientific analysis, I reply that it is no more complicated than several other business factors about which we have learned a great deal in recent years, and I contend that advertising cannot afford to remain without the pale of thorough scientific study.

The most important reason why standards are needed in measuring the effects of publicity is to secure a measure which, within certain limits, will indicate to the executive the probable effectiveness of different kinds of publicity upon different kinds of goods. As in other phases of management, standards are indispensable to prudent publicity management.

Publicity Standards.—Much of that which was said above relates to publicity standards and to their establishment. The following publicity standards will be discussed briefly:

1. Standards for dollar sales to dollar spent for publicity.
2. Standard relationship of publicity volume to sales volume.
3. Standards for apportionment of publicity effort to various territories.

Standards for dollar sales to dollar spent for publicity are important for many reasons, the most important of which is that it determines the amount of money that can be "most advantageously" spent for publicity for different classes of goods. Many concerns are interested in standards for this purpose. Some enterprises determine the amount that may be spent for publicity as a certain per cent of the sales. This percentage varies with different concerns in the same line of business as well as among various types of concerns and is too often arrived at arbitrarily. It also varies within the concern, if

¹ President, Electric Hose and Rubber Company in *Nation's Business*, June, 1928, p. 58.

products of widely different gross-profit margins are present. If the standard be set by the use of the scientific method, accounting tools may be of assistance in this matter. An illustration will make this more easily understood. Suppose that the records of past performance be studied by the scientific method. Care will, of course, be taken to eliminate the seasonal and the cyclical factors. The similarity of sales to publicity expenditure may then be determined. With these results, a forecast of how much should be spent for publicity to secure a certain amount of sales could be made. This process should be carried on until the standards can be set with reasonable probability of being attained in performance and serve as a reasonable basis for judging results. This process, of course, takes much for granted; that the mediums used are substantially the same "value"; that the copy is comparable; that the service is comparable, etc. Adjustments may be made in the data to cover the most glaring features of non-comparability. It should be understood clearly that interpretation of facts is of more importance than the facts themselves and that action on the results secured is necessary. A careful study of the facts, as set forth above, is necessary for proper interpretation.

Mr. Garretson¹ says:

There is no reason why advertised goods cannot be classified into groups that are subject to scientific examination, and why every variation and phase of the influence of advertising cannot be established for appraisal and study. I am convinced that the recorded facts and details of as few as 500 advertising campaigns would furnish a committee of unbiased, scientifically trained men with the means of making advertising a vastly more certain and beneficial aid to modern business.

Such a study of the data relating to publicity would do much to discover the laws of advertising. Individual concerns should attack the problem of setting standards for publicity. Cooperation with other enterprises would assist materially in the study.

What relationship exists between the volume of space used in publicity and the volume in sales of physical commodities? At what point do the best results obtain? These are some of the problems that the controller, through his staff, by the aid of the statistical method, should be able to attack with the accounting instrument. It should be emphasized, however, that in most business problems several factors influence the results and that the conclusions reached must always be interpreted in the light of these facts. For example, the volume of

¹ *Ibid.*, p. 58.

sales will be influenced by the price, salesmanship, etc., and the volume of advertising alone is not a proper criterion. Thus the raw data have to be evaluated before adequate studies can be made to determine any relationships. It should be said, however, that many of the forces at work to produce profits may be isolated for study and an evaluation made of the most important factors.

A standard for the apportionment of publicity effort to various territories is important because upon it may depend the success of the concern. Possibly the most usual basis for such an apportionment is that of sales in prior periods. Another basis in use is that of the "potential" market. These bases are opposite in tendency; the former relies too much on the past and the latter relies too much on "normal expectations." It would appear that best results could be secured with a combination of these bases. Just what combination to use is a question for research and experiment.

The Publicity Budget.—The publicity budget should include all the proposed expenditures of the publicity department. It should be made out in terms of the organization and be analyzed into an adequate classification of expense and asset items. Wherever possible, it should be stated in units and prices.

Achievement Records.—The achievement records should be kept so that the basic information with which to compare achievement with the budget can be made easily. The exact nature of these records will be determined by the individual case. They should conform to the requirements of records previously set forth.

Reports for the Publicity Manager.—The controller furnishes the publicity manager with important information by means of reports. In general, these reports are compiled from information drawn from the budget and achievement records. These reports are not, however, confined to the budget and expense records kept for the publicity department. The scope of the reports will be determined by the requirements of the executives.

Much information which is used by the publicity manager comes from the office of the controller. Much of the research work must come from information kept in several departments under the direction of the controller. For this reason, the records should be devised so that the basic data for the reports can be obtained in a usable form without a considerable amount of additional expense. This also applies to much of the research and analysis work.

Expense reports in terms of the budget should be rendered at regular intervals. Significant causes for variation between the budget and the achievement should be analyzed and interpreted. The several department heads should receive reports of a similar nature covering their operations.

Since the work of the publicity department is closely connected with making sales, it seems quite evident that the manager of marketing must consider the influence of publicity upon sales as well as direct selling. The publicity manager is likewise interested in the comparison of his activities with sales. His reports should compare budgets of sales and publicity expenditures with achievement.

To keep the specific budget allotments under control, a periodic report should be prepared from records which show, at all times, the status of the budget. If the budget is for a longer period than a month, it may not be feasible to allot all of the expenditures to particular budget items because publicity plans for a long time in advance are usually not practicable.

The Reports of the Publicity Manager.—Like other executives, the publicity manager should render his tentative budget covering operations for the budget period and such other reports as the budget procedure may require. A number of reports must be rendered as a basis for the budget. He should approve the reports of specialists that do research in his particular field. On the basis of these reports he should render reports to the manager of marketing which give his interpretation of the research work.

The achievement reports which the publicity manager renders form the basis for the records kept by the controller relative to the publicity function. On the basis of the records and the budget, the controller should render his reports on the publicity function. These achievement reports come in the form of requisitions for expenses of one kind or another, or for the acquisition of fixed assets used by the publicity department.

Accounting is an important tool for the publicity manager in the control of his activities. Much of the information needed for this purpose may be embodied in the records of the accounting department. To serve the purposes of the publicity manager, however, this information must be more than a classification of expenses. The budget and achievement reports must be analyzable in considerable detail. Various internal statistical data are also required, the exact nature of which is usually an individual problem.

CHAPTER XVII

ACCOUNTING AS AN AID TO THE MANAGER OF PROCUREMENT

The Procurement Function.—One of the prime functions of business enterprises is that of procurement. It has to do with the acquisition of commodities or services. In many businesses, the acquisition of a salable product is a task which requires a number of steps. Materials must be purchased, received, stored, and shipped. In a manufacturing business these materials must have work done upon them. This requires a design of the article to be fabricated, machinery to do work upon it, planning to insure the economical manufacture of it, and the application of human labor to the manufacturing process.

A Classification of Business Enterprises.—From the viewpoint of management control, business enterprises may be classified as follows:

1. Those which procure goods in anticipation of sales.
2. Those which procure goods only after they have been sold.
3. Those which procure goods either in anticipation of sales or in response to orders.

Where goods are procured in anticipation of sales, the object should be to procure the goods in the most economical manner and have them ready for delivery when required. Where goods are sold before they are procured, the object should be to plan procurement so that the goods may be procured in accordance with proper predetermined results. A combination of the two classifications gives the third classification enumerated above.

The Relation of Marketing to Procurement.—In a well-conducted business there is a very close interrelation between marketing and procurement. It is a well-recognized fact that best results are secured where the concern procures only those goods which can be sold on favorable conditions. If the goods can be sold under favorable conditions, they may be procured for sale. This implies that the two problems should be solved simultaneously. If they are not so solved, goods may be procured which cannot be sold at a profit or an attempt

may be made to market goods which the concern cannot procure economically. In practice, the principles stated above have been violated often. The most usual type of error is to be found in stating the price at which goods can be procured and marketed.

The Functions of the Manager of Procurement.—The chief functions of the manager of procurement may be classified as follows :

1. A director and coordinator of procurement activities.
2. A student of methods in procurement.
3. A counselor of the minor departments under his direction.
4. A member of such committees as the organization has that affect procurement.

This classification of functions is similar to that of the manager of marketing. Two of these functions will be discussed briefly. The other two functions have been treated previously, and that treatment applies here equally well.

From the viewpoint of management control through accounting, the manager of procurement performs important duties in connection with his functions of direction and of coordination. As head of the procurement organization, he performs the important function of directing the activities in the procurement of goods. This implies that he must be assisted by an organization, the activities of which, being extensive, will require coordination and control. The function of direction is understood to mean that which has to do with major plans and performance. It is the direction of the work of other executives.

Prudent direction and coordination imply a knowledge of methods by which certain results are to be secured. For this reason, the manager of procurement should be a student of procurement ways and means. It would be more accurate to say that he is the major executive in charge of ways and means for procuring goods. He must be able to appraise the results secured by other executives and to help set the task to be performed by those under his direction. This implies a reasonable knowledge of the ways and means at their disposal to secure the predetermined results. Much knowledge of ways and means may be furnished by staff men. Technicians may be employed to improve the ways and means of procurement. Much waste takes place in industry because the manager of procurement is not alert to improvements in methods. Accounting has often served as a tool to point to the need of better methods, as discussed below.

Organization for Procurement Control.—The need for proper organization for purposes of proper accounting control has been stressed in previous chapters. To fulfill the requirements for proper organization, the Manager of Procurement performs the important function of the executive head of the procurement function. Under his direction, are a production manager and a facilitation manager. See Figure 21. The Manager of Procurement is directly responsible to the Chief Executive. A number of employees and staff assistants will be required to assist the Manager of Procurement in performing his duties.

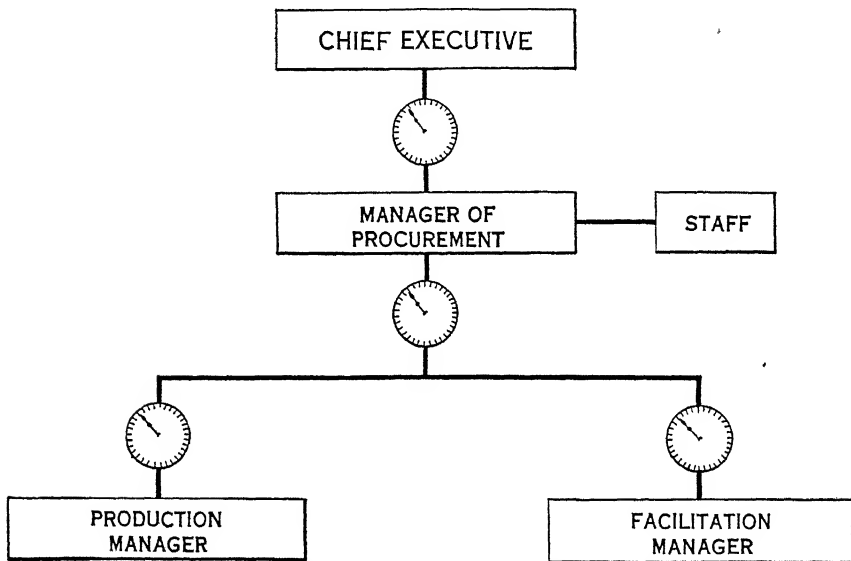


Figure 21. Organization for Procurement Control.

The interrelated phases of organization on a chart are often a matter which must be left largely to the reader to surmise. It is important to remember that these inter-relationships exist. All of the parts fit together and operate to form the business mechanism. Many of our corporations are large enough to apply scientific principles of organization with very desirable results. In large organizations the questions of coordination and control are so important and the benefits to be secured from such coordination and control are so great that very large sums of money may be expended profitably in accomplishing the desired end. The comparatively small concern can ill afford to be without adequate methods of control of its operations. For accounting to accomplish its highest purpose, the elements of good organization must

be present. The manager of procurement forms an important link in such an organization.

Accounting Instruments to Aid Procurement.—Modern industry makes a very large use of accounting. Mr. A. H. Church¹ says:

“Executive success depends upon three elements: (1) recognition of what facts are truly significant; (2) accurate record and convenient presentation of these facts; (3) judicious action based on study of the facts. Executive success is therefore largely dependent on the function of comparison.”

He uses the word “comparison” in a more restricted sense than the word “accounting” is used herein. The instruments of accounting provide a means for the expression of what the executive expects to do, the success which he has in performance, and the chief significant causes for success and for failure in performance. The first phase of this work is the budget, and the other phase of the work is the report on achievement in comparison to expectations.

The tendencies which have led to modern management have brought with them a demand for information which is “truly significant.” The interest of management in accounting is largely confined to a desire for information which will serve to predict. Executives are men of action. Unless accounting can provide accurate, reliable, and immediate information to serve as a basis for executive action, then the executive must resort to general impressions and intuition. The ease with which proper accounting information may be obtained makes it uneconomical for an executive to operate without the employment of basic accounting information.

Procurement Research.—Procurement research covers the two principal divisions of the work of the procurement manager, and this is a part of the larger question of research for executive control. The general field of procurement research, in relation to the field as a whole, was indicated in the previous chapter.

The manager of procurement requires prudent research to serve a wide variety of purposes. These purposes may be stated as follows:

- (1) To serve as a basis for stating what can be done, and
- (2) To indicate ways and means for getting the work done.

Executives too often appraise future tasks from an inadequate knowledge of past results. The weakness of this procedure is that it tends to place two performances on a parity while the cases may be quite distantly related. For example, an executive may say that he can

¹ *The Science and Practice of Management*, p. 347.

deliver the products called for on a given production program, with given equipment and men in a stated period, because he has done so in the past. This may neglect entirely the fact that the work could be done more economically. Research and experiment, if intelligently conducted and performed, serve to assure the executive that the methods employed in the productive process may be appraised, are controllable, and are fundamentally sound.

Procurement Capacity.—The manager of procurement is vitally interested in the procurement capacity of the facilities which are under his direction. This arises from the fact that he must appraise the results of those under his direction in the light of the standard set for them. The determination of productive capacity is usually a question for research, analysis, and expert opinion based on technical information. The necessity for definite knowledge of productive capacity has been recognized for many years. The procurement managers of many plants know the capacity of their facilities, as they are operated, and they receive daily reports of the capacity used.

A knowledge of procurement capacity enables the management to apportion its efforts so as to deliver required goods in an economical manner. This may be illustrated by reference to a concern which receives advance orders. These orders may be translated into procurement capacity. This enables the management to know how much work is ahead. A knowledge of capacity to be maintained will indicate when specific orders may be delivered and the length of time the bookings will keep the plant in operation. This practice is likewise applicable to the policy of procurement for stock.

Productive capacity is usually expressed in units. If several different kinds of units are employed, it is necessary to express the several units in the form of an index of capacity. Operating performance may then be expressed as a ratio of capacity used to total capacity. Thus, if a concern has maintained an average of 70 per cent capacity for a week, this indicates that 30 per cent of the capacity is not utilized. Different methods of computing productive capacity are found in practice. The factors which enter into each method should be known, if an accurate knowledge is to be obtained of productive capacity.

One of the important means of control in procurement is a knowledge of procurement capacity, potential as well as actual. For this reason, the management should be receptive to improvements in ways and means of securing better results. Intelligent research and experiment in this field is of major interest to the manager of procurement.

A fundamental approach to this problem is through a knowledge of costs.

Relation of Costs to Procurement Control.—A knowledge of what costs probably will be under given conditions is fundamental to procurement control. If proper control is to be exercised, the marketing division of the business must know procurement costs in advance of operation. On the basis of the procurement cost estimate, the manager of procurement sets out to procure goods at costs which are at least as low as the cost estimates. The utility of standard costs as a means of control was indicated in Chapter XI.

The manager of procurement is vitally interested in not only what costs will be under given conditions, but also in what they should be under different conditions. This calls for research and experiment. Standards are relative, and what is standard one year may not be standard another year. This results from fundamental changes revealed by research and study. On the whole, standards set properly will not change often. The chief duties of the management then resolve themselves into the application of executive action to remove controllable obstacles so that procurement may proceed in accordance with standards. The forecast of procurement costs is set forth in the budget.

The Procurement Budget.—The procurement budget is used for the purpose of coordinating the production and the facilitation budgets. The basis for these budgets is found in the marketing budget. The sales program sets forth the particular items which are to be sold and the rate at which they are to be sold. With this information in hand, the production budget and the facilitation budget may be set up and the work properly scheduled.

In setting the sales program, adequate consideration must have been given to procurement facilities, else it will have to be adjusted to production capacity. In setting the sales budget, an adjustment may be made in the direction of increased facilities, increased efficiency in the use of present facilities, and the purchase of part of the commodities, or in the direction of a direct reduction in sales. The work leading up to the setting of a budget requires careful research, study, and planning. The manufacturing end of a business is not usually as flexible as the selling end of the business. A few new articles, in many cases, may be added to or dropped from a salesman's line without disturbing the manager of marketing, but this is not usually true in the procurement end of the business engaged in manufacturing for stock. For this reason, it may be necessary for the marketing depart-

ment to devote its energies to the marketing of the commodities which the manufacturing phase of the business can procure best. The advantage of placing the major part of the detail work connected with the budget upon the marketing function is that this places upon them much of the responsibility for changes in the product and in procurement. The manufacturer is interested in procuring goods while the salesman wants to give each customer what he wants. These are diametrically opposed and require reconciliation for successful manufacture. Who in the organization is better able to do this than the manager of marketing?

A preliminary budget covering the entire operations of the procurement function should be made out to cover the preliminary estimate of sales. After the sales budget is approved, the procurement budget should be revised to arrange for the delivery of the required goods according to the sales schedule. This must give due consideration to inventory requirements and the economical procurement of goods.

Procurement Control.—The control of procurement is brought about by the maintenance of a predetermined equilibrium between the procurement activities of the business. This is an important function of the manager of procurement. To accomplish this purpose, ways and means must be at hand for ascertaining the relation between predetermined conditions and performance. Accounting information furnishes to the management the principal tools for securing this control, but control comes only through executive action. The procurement budget sets the goal for action. The performance reports indicate the success in performance and the causes for variation between the budget and the achievement. Executive action is applied to reduce these variations to a minimum. These are requisites to procurement control.

Under ideal conditions procurement control would consist of being able to deliver the exact quantity of goods desired at a stated standard cost without any inventory or without variations in cost. Even if it were possible to control procurement in practice, more economical results could be secured by a different method. This may be illustrated by procurement for stock. Usually goods cannot be produced as cheaply in small quantities as they can in larger quantities. Production of the most economical quantities is essential to prudent management. This usually necessitates production for stock, as in the case of automobiles, foot wear, clothing, etc. Where the goods are

special order, as power plants, ships, etc., the most economical quantity is usually the specific order. Under these conditions, procurement control consists of (1) the establishment of a minimum and a maximum size lot and (2) the provision of adequate means for enforcing these limits. Other phases of this subject are treated in the following chapter.

The Control of Quantity.—Every item to be carried in stock should have a minimum and a maximum quantity determined for it. Except by executive order, the inventory should be contained within these limits at all times. The principal factors to be considered in determining inventory limitations are as follows:

1. The estimated periodic sales.
2. The rate of sales.
3. The economic lot size.
4. The margin of safety.

Several formulæ have been advocated for use in the control of inventory quantities.¹ The evaluation of the several factors which enter into the problem is a subject for research and for executive decision.

The means for enforcing inventory limits of particular commodities are many. One important way of doing this is by means of the perpetual inventory of stock and of requirements. If the stock records contain a clear statement of inventory requirements and limits, careful clerical work will indicate the stocks which must be replenished. Another way to indicate the necessity for additional stocks is by means of bin tags placed on the stock. There are several variations of this plan. One is to keep a perpetual inventory of quantity on the tag. Another method is to place the tag in the shelf on the material that indicates the minimum stock. Before any of the stock under the tag may be removed or reserved, it is necessary for the storekeeper to place an order for additional stock.

The Control of Quality.—In their desire for greater production, many businesses have neglected quality. Radford² says that "when quality is controlled, quantity takes care of itself." Some procurement managers stress quality by personal inspection at regular intervals. One concern presents a recent specimen of each product produced in comparison with the standard models at every directors' meeting.

¹ See, for example, *Manufacturing Industries*, Vol. XIII, pp. 199 and 369.

² L. P. Alford, *Management's Handbook*, p. 701.

Accounting serves as a convenient basis for the control of quality. The procurement manager should receive periodic reports which show the status of quality maintenance. A number of sources are available for the collection of data regarding the quality of a product. The ultimate test of quality is use. Failure in use may be due largely to failure of quality, as illustrated previously in the storage battery case. Usually the inspection methods employed by a concern may give reasonably good assurance that the quality of the product is standard. A study of the record of articles which fail to pass inspection may give some insight into quality. Inspectors are human and in many cases pass some articles which are not up to standard rather than have too many failures. There is also the question of errors. Careful records of reinspection should be maintained and studied by the statistical method to ascertain the probable failure of the product to reach standard.

Reports for the Manager of Procurement.—The principal means by which the manager of procurement is kept informed of the activities under his direction is through reports. The controller furnishes the accounting reports for the principal executives. The general type of budget and performance reports which the manager of procurement requires are as follows: cost of goods sold and procurement profit. These reports should be analyzed in such detail as to show performance in comparison with the budget for each organization unit under his direction.

These reports should cover not only a good classification of accounts but also vital information regarding the efficiencies of each unit. It should be understood clearly that the accounting reports should contain more than simple budget and performance information if they are to be of any considerable value to management. The management must rely largely upon accounting reports in the management of a sizable business. This implies that the reports should cover every significant phase of the work. The information that is "truly significant" is largely an individual problem. In general, the manager of procurement is interested in reports which show the relation of performance to predetermined results and the causes for significant variations. The causes for these variations should be analyzed in such a way that he may place responsibility fairly.

The manager of procurement should be furnished with any information that will aid him in the performance of his functions. This will generally embody access to all reports to which the manager of market-

ing has access. He is vitally interested in cost information and the factors which contribute to cost of goods procured. In most businesses, control is maintained by advance knowledge of the factors that may be influenced by executive action. The manager of procurement is directly concerned with only the major phases of this question. The details must be left to others under his general direction.

The controller bases most of his reports to the manager of procurement on information furnished in the form of "orders." The manager of procurement, as such, is interested mainly in the question of whether the sum total of these orders by groups is in conformity to the major procurement plans. This may be made more concrete by an illustration. Suppose that a concern carries ten groups of commodities in its raw material inventory. The manager of procurement would be interested in knowing what constitutes a balanced stock, the minimum and the maximum stock requirements for each group of commodities, the budget for each group of commodities, and the status of performance in comparison to the budget and other standards. This enables him to appraise results and to plan for the future.

Reports of the Manager of Procurement.—The preliminary and revised budgets are the principal reports rendered by the manager of procurement. A large part of the information secured by the accounting function, with reference to procurement, comes to it in the form of minor records. These records are known as "orders" or "requisitions" of one kind or another. These detailed orders are a part of the regular routine of those under his general direction and do not require his attention.

In the performance of his duties, the manager of procurement will require access to much of the information which those under his general direction and other executives require frequently. For logical treatment, these questions must be discussed elsewhere.

CHAPTER XVIII

ACCOUNTING AS AN AID TO THE PRODUCTION MANAGER

Production Defined.—Among writers on business subjects there has grown up a usage of the word “production” to mean the design of commodities, the provision of physical equipment for manufacturing, the planning of manufacture, and the performance of the manufacturing operations. It is in this sense that the word “production” is used here.

Organization for Production Control.—For purposes of coordination and control, the main divisions of the production function must be headed by a responsible head. Mr. Lee Galloway¹ says:

Specialization is only one-half of the cause of modern industrial development. Coordination is the other half. A modern, highly specialized business enterprise would be as helpless as a jellyfish, if it did not have its specialized activities controlled and coordinated by a highly developed office.

According to the principles of organization previously set forth, the production activities should be coordinated by a production manager.

The production function is one of several equally important functions in a business. The business as a whole should be a coordinated mechanism, each part working in complete harmony with the other parts. For purposes of analysis and treatment, these functions are segregated, “but the task the concern is established to perform has no beginning—all middle—no end.”²

In Figure 22, the principal executive who exerts a major coordinating influence is the manager of procurement. The production end of the business is coordinated by the production manager, who has under his direction the managers of the four basic phases of the production function; namely, design, equipment, planning, and operation.

Procurement Control.—The several activities under the direction of the manager of procurement require coordination and control if

¹ *Office Management*, p. 8.

² H. S. Dennison, *Bulletin of the Taylor Society*, Vol. IX, No. 3, p. 101.

best results are to be obtained. The production function is not complete within itself. The planning function is not complete within itself. The planning function, under the immediate supervision of the production manager, cannot be most effective unless its activities are co-ordinated properly with the functions of the facilitation manager, discussed in the chapter following. The coordination of these various activities, and others, is called "production control" by many writers. Here, too, no uniformity exists¹ in defining "production control." As used in this treatise, procurement control consists of the ways and means for coordinating and controlling the procurement and other

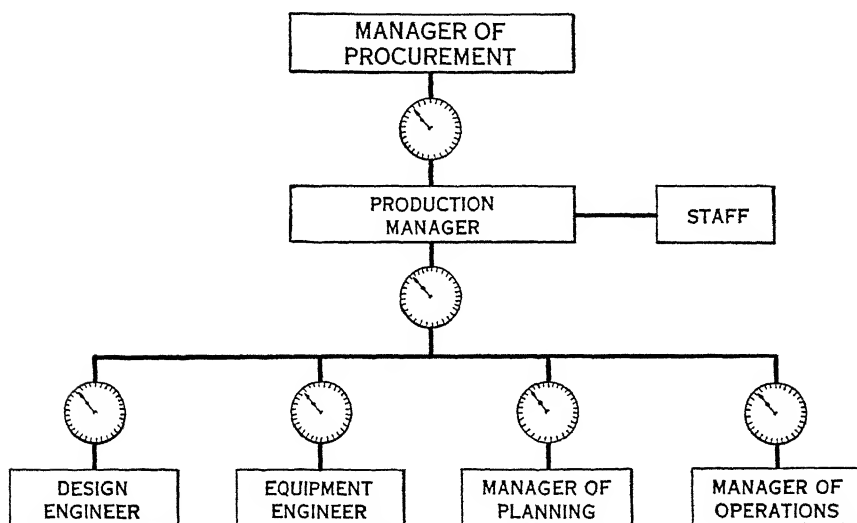


Figure 22. Organization for Production Control.

closely related activities of the business. The law of production control as set forth by Mr. Alford is stated as follows :

The highest efficiency in production is obtained by producing the required quantity of product, of the required quality, at the required time, by the best and cheapest method.

Because of the wide scope of production control, the subject as a whole is treated under various headings in Part V, and other parts of this book.

The Production Budget.—The basis for the production budget is that of the budget of goods to be sold and the inventory budget.

¹ See Bulletin of the Taylor Society, pp. 260-283, and *Manufacturing Industries*, Vol. XIII, p. 25; also Vol. XI, p. 271, *Management and Administration*, Vol. VIII, p. 463 and Vol. IX, p. 253.

This must be qualified to provide for only those goods which are produced by the concern. Goods which are purchased are considered a part of the facilitation budget. The production budget should be composed of a major and four principal minor budgets, to follow the line of organization. These budgets should be drawn up so as to cover an adequate classification of accounts—asset as well as expense or cost accounts. The particular classification of accounts will depend upon the requirements for each business.

In setting up the accounting procedure, care must be exercised to see that the items contained in the budget of each official are subject to his effective control. The manager of operations, for example, will have effective control of the wages and production of those engaged in operations. By effective control is meant the ability to influence or to control within certain limits. More specifically, it refers to variations from standard or predetermined results. Variations may occur in the budget of one official for which another official was responsible. For example, wages may be in excess of standard on a particular operation because of poor equipment, and poor equipment may be the result of poor design, etc. The operating function, or the workmen and executives who compose it, is not responsible for the material used for production, its quality or delivery date; the equipment provided and its maintenance; and route through which the materials must pass in production; nor the type of work to be done upon the materials. The necessity for and the method of placing responsibility have been dealt with in previous chapters. A consolidation of the minor production budgets forms the basis for control by the production manager.

Where goods are produced to order, the principles of budget procedure are essentially the same as where goods are produced for stock, but in many businesses the ability to forecast accurately is different. The forecast of sales should give a working plan for the use of production facilities. The marketing function should then endeavor to sell the plant capacity in accordance with plans, as far as possible. The policy of the management regarding rush orders should be understood clearly and adhered to strictly. If the schedule can be revised without undue loss or failure to deliver other goods, rush orders may result in profitable business.

Production Records.—The principal records used in the control of production are accounting records of one kind or another. The devices used for the presentation and interpretation of the data are essentially accounting tools. Cost accounting records serve as a base

for the control of production. Every expenditure of money (or effort) should have its supporting documents. These documents are not considered by some executives as being strictly accounting data, but in the nature of statistical and other documents. It should be remembered, however, that accounting must concern itself with basic data.

To illustrate: a deed to land and drawings of the buildings thereon form a part of a first-rate accounting voucher. Accounting is interested in more than a knowledge that \$50,000 has been expended for equipment. The nature of some accounting reports, and the way in which accounting data are often recorded for convenience, serve to give a false idea of the full extent of the knowledge demanded of proper accounting records. Basic accounting data consist of an adequate knowledge not only of how much time and money have been expended, but also of the manner in which the "labor and overhead" were expended and the results secured. This requisite to proper accounting records was advocated by Taylor in his "*Shop Management*," and has been further emphasized by Gantt, Emerson, Williams, and others. The term "record" is often used to indicate the written account of performance data only. It is used in this treatise to cover any data relating to accounting which are reduced to writing, or other means of communicating information, as the chart, the graph, the requisition, and other records which contain basic accounting information or its summarization. Some of the most important basic records are discussed below.

Production Reports.—Production records contain a multitude of details. One purpose of production reports is to analyze, to classify, and to condense this information in such a manner that it will carry a message to the executive and others. These messages may be of many kinds. For basic management purposes, reports consist of showing what has happened in comparison to what was expected to happen and in explaining the causes for the important variations. Certain kinds of reports may be limited to any one of these three fields; namely, predetermination, performance, and variations between them.

Production executives require many kinds of "statistical reports." That is, more accounting information than the majority of treasurers are interested in. Internal statistical reports are of so varied a nature that no two of them may be alike in different businesses.

The reports for the production manager consist of budgets and performance reports for the principal executives under his direction. He views the production problem as a whole. His reports must assist

him in visualizing the problem, if they are to be of any utility to him. What tasks were to be undertaken by each executive under his direction and how were they met? What should each executive do during the coming period? These and other questions are fundamental to the production manager. The performance reports are chiefly cost information. The management cannot exert the most influence upon cost unless it is known what the cost should be, before the work is started. Reports must be available to show the progress or status of the work at proper intervals. Thus, the executive practically is kept in continuous touch with performance, and has ample time to correct unfavorable trends where executive action can remedy the situation.

The reports for the executives in charge of design, equipment, planning, and operation are of somewhat similar character to the reports for the production manager. The principal difference consists of the supporting detailed analyses which are characteristic of the reports for those close to the work of production. The production manager may have need for detailed analyses, in some cases, but in general this is the work of those under his direction. In many cases the manager of operations, for example, needs to know every significant detail connected with the performance of work. The records may be analyzed so as to show the contributing causes for failure to attain standard in performance. In this manner the executive is able to exert his influence upon the specific difficulty and to remedy the situation, if all of the work has not been done. The principal accounting reports rendered by the production executive are the preliminary and final budget, and the detailed requisitions used for accounting and production purposes, such as are connected with the master schedule.

Accounting to Aid the Design Engineer.—The design engineer, like all other officials, is vitally interested in the budget which he assists in setting, and in the performance records and reports covering his work. Such records and reports should be suitable for his use and be used in a judicious manner. The design engineer receives orders to design certain equipment through executive channels. This work may call for the origination of equipment, etc., or the application of recorded experience to the solution of the problem. Properly applied accounting may do much to assist in this work. The experience of other firms may be drawn upon liberally. The various recorded data may be studied and the facts secured thereby may enable the engineer to design equipment that is best suitable to the needs of the business.

[illegible][illegible][illegible]

Form 5. Perpetual Inventory of Equipment. (Accounting for Fixed Capital Expenditures, by Melvin F. Wagner, National Association of Cost Accountants Bulletin, Feb. 15, 1929, p. 757.)

ACCOUNTING FOR EXECUTIVE CONTROL

If the accounting data that are available to many business are studied properly before the design work is started, many costly mistakes will be avoided.

DATE	ORDER NO.	CHARGE SYMBOL
REPAIRS TO BE MADE	MACH. TYPE	MACH. NO.

MACHINE PARTLY-TOTALLY DISABLED

PARTS BROKEN OR WORN _____

CAUSE OF BREAKDOWN _____

WORK IN MACHINE AT TIME _____

PLEASE MAKE, ABOVE REPAIRS BY	MONTH	DAY	YEAR	A. M.	P. M.

REPAIR ORDER

SIGNED _____

[illegible]

Form 6. Repair Order. (Shop and Office Forms, p. 73, Wallace Clark, McGraw-Hill Book Co.)

Accounting to Aid the Equipment Engineer.—That which was said about profiting from past experience in comparison to expectations, applies to many phases of management. The equipment engineer can use this type of information in performing his duties. If equipment has to be built, cost information may assist in getting the work

ACCOUNTING AS AN AID TO PRODUCTION MANAGER 289

done in an economical manner. Such information may enable the management to decide whether or not such equipment could not be more economically purchased elsewhere.

A perpetual inventory (Form 5) of the plant and equipment will furnish the management with significant information regarding the plant investment, the performance of the equipment, its general state of maintenance, and other information. The Repair Order (Form 6) is another useful record. The expense connected with repairs will yield vital information to the management if significant items are entered upon the inventory cards. One manufacturer used such information, among other things, for detecting careless operators. The procedure

MANUFACTURING OFFICE		DATE	REQ. NO.
PLEASE FURNISH THE FOLLOWING:			
QUANTITY	PART NO.	PART NAME	DATE WANTED
SIGNED _____			
WE EXPECT TO DELIVER ABOVE ON MANUFACTURING ORDER NUMBER _____			
SIGNED _____			
B75M-10-24		REQUISITION FOR MANUFACTURE	

Form 7. Requisition for Manufacture. (Shop and Office Forms, p. 49, Wallace Clark, McGraw-Hill Book Co.)

for placing responsibility for breakage is discussed elsewhere.¹ If the operator were responsible for, or caused excess breakage, the management could investigate and apply executive action. A budget for repairs, together with intelligent executive action, may assist materially in lowering the losses due to breakdowns and excessive maintenance. Wherever feasible, standards should be established for these items. Records and reports covering these data should be available for the management at regular intervals.

Accounting to Aid in Planning.—Planning seeks to combine materials, labor, and overhead in the most economical manner to obtain the goods desired in the required time. Recorded experience in comparison to plans and causes for variations is vital information to any

¹ Chapter XIX.

[illegible]

planning department immediately translates this order into production terms; namely, materials, equipment, and men. Materials must be reserved, if in store, or ordered if not in store. Material requisitions (see Form 2) should be filled in properly to insure delivery of the materials at the required time and place. The master route schedule (Form 8) must be consulted to ascertain when the required operations can be performed. The work connected with this phase of planning is called routing. A route sheet (Form 9) should be

INSTRUCTION CARD		FEED	SPEEDS	FEEDBACK	TIME
DETAIL INSTRUCTIONS		AMT	STROKE	DOWN	TIME
1	Change card at window				2.00
2	Take to window				.50
3	Set up drill press and select tools				5.00
4	Assemble fixture to cap				.13
5	Land cap and fixture on press				.02
6	Spindle down and locate				.05
7	DRILL (1st #47 hole)	1800			.25
8	Move cap, spindle down and locate				.06
9	DRILL (2nd #47 hole)	1800			.23
10	Remove fixture				.04
11	Land cap in pan				.01
12	Get card signed				2.00
13	Take to window				.50
Allowance					10.00
PREPARATION					3.00
					.79
.79 Min. (Hand ing Time) at 37%					.29
Time per piece					1.08

INSTR. CARD		DATE	TIME	TIME	TIME
DETAIL INSTRUCTIONS		DATE	TIME	TIME	TIME
1/26/17 WBH					

INSTR. CARD		DATE	TIME	TIME	TIME
DETAIL INSTRUCTIONS		DATE	TIME	TIME	TIME
1/26/17 WBH					

Accounting to Aid Operations.—The well-conducted planning department furnishes all the necessary forms to the operating department for its use, so that the operating department is relieved of much detail connected with the provision of accounting and operating information. Operating time, output, materials used, and other data

¹ Other important records are also used. Illustrations of the principal records may be found in *Shop and Office Forms*, by Wallace Clark; and *Management's Handbook*, by L. P. Alford. For further illustrations, consult the bibliography.

are necessary for intelligent operation. These data form basic accounting information and are furnished largely by the operating unit. Additional materials, tools, etc., must be secured sometimes. Credit slips are required for the return of stores. The planning department cannot make exact provision for every contingency so that records for contingent items must be provided by foremen or other designated persons.

Operating reports, based upon results in comparison to standards,

RET'D ISS'D				ORDER NO.			
MAN'S NAME				DEPT.		MAN'S NO.	
TIME ALLOWED		TIME TAKEN		FINAL OPER.			
				ALL ON THIS OPER. FIN.			
CONUS		HOURLY RATE		ALL ON THIS OPER. N.F.			
				TRANSFERRED			
PAY FOR		WAGES		BREAKDOWN			
				CAUGHT UP			
MACH. NO.		RATE		EXPENSE			
NAME OF PART				PART NO.			
OPERATION NAME				OPER. NO.	PCS. FIN. ON THIS OPER.	RATE	WAGES
SHOP ORDER	LAYOUT	MAN RECORD	PROD. SHEET	PAY SHEET	COUNT AND QUALITY CORRECT		
P-10-20M-10-24 PRODUCTION CARD							

Form 11. Production Card. (Shop and Office Forms, p. 54, Wallace Clark, McGraw-Hill Book Co.)

provide the management with significant information regarding operations and variations from standard. The manager in charge of operations is interested vitally in variations from standard, because it is his function to reduce these variations to a minimum. The efficiency of the management engaged in operation is determined largely by its ability to have the work carried out in agreement with plans and standards. Executive action should be directed to remove any causes that hinder performance in operation. An efficient management reduces these variations to a minimum.

CHAPTER XIX

ACCOUNTING AS AN AID TO THE FACILITATION MANAGER

Facilitation Defined.—The two broad functions of procurement have been designated as production and facilitation. This latter phase of the work coordinates the procurement activities other than those of

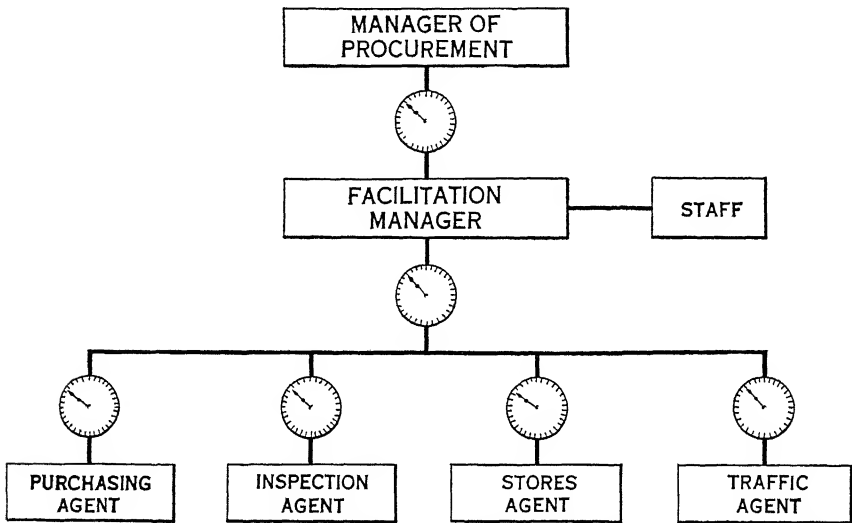


Figure 23. Organization for Purchasing Control.

production. These activities do not consist of every phase of "facilitation" in its broadest meaning. The facilitation function, as the word is used herein, is meant to include those activities which have to do with intelligent buying, inspection, storing, and traffic. The scope and limitations of these functions will be discussed below.

Organization for Facilitation Control.—In conformity with the principles of organization set forth previously, the broad facilitation functions are coordinated and directed by a manager. In Figure 23 the facilitation manager is shown as the executive head of the facilitation function. The functions of purchasing, inspection, storing, and traffic are each headed by an agent. In a sizable business these several

functions may require further subdivision to serve their purposes best. In making this subdivision, care should be exercised in defining the duties assigned to each subdivision so that the duties will follow along as clearly distinct lines as conditions permit. The aid of staff technicians may be required to furnish vital information upon a variety of subjects in which the facilitation manager and those under his direction may be interested.

Buying as a Facilitation Function.—The functions of purchasing are a part of the broader phases of facilitation. The work connected with buying relates mainly to the securing of prices, the placing of orders, the follow up of orders, and the adjustment of claims in connection with such orders. The principal "paper" work connected with the facilitation function is strictly accounting and should be treated in a similar manner to that indicated in connection with marketing.

A considerable amount of work must be done in buying through written instruments and records which may not be strictly related to accounting. For example, the maintenance of the catalogues of suppliers, of price cards for commodities, prices paid for particular goods, the follow-up procedure, and the adjustment of claims are not strictly accounting functions. Many questions relating to these phases of buying are interrelated with, or form an integral part of, accounting in its larger implications. Considerable waste takes place in business because of duplicated accounting work done in connection with the facilitation function. This may be avoided largely by the proper co-operation between the accounting function and the facilitation function and proper accounting methods.

The purchasing agent places orders for only those articles which are called for by the production schedule (or requirements) and the schedule of requirements for other phases of the business. Under a comprehensive budget procedure, the nature of the goods to be bought is specified. This leaves the buying agent free to place the orders so as to interpret the buying policy of the concern to the best advantage. To illustrate: if the requirements for the major items are known in advance, the purchasing agent may secure the goods at advantageous prices if advance orders can be placed immediately before or while prices are rising and the goods consumed before prices fall. Quantity and/or contract buying is also possible.

As far as practicable, goods should be bought on specifications. The purchasing agent must consider not only specifications and prices,

but also delivery dates, the reliability of the vendor, transportation costs, and other factors.

Inspection as a Facilitation Function.—Inspection is defined as the art of comparing goods with certain standards for those goods. Inspection is carried on, to a degree, by most operators. As the term is used in this treatise, it refers only to the work of an agent or other employee engaged in the special task of inspection. There are several stages at which inspection may take place, the most important of these are:

1. Inspection of goods purchased.
2. Inspection of goods entering manufacture.
3. Inspection of goods in process.
4. Inspection of finished goods, and
5. Inspection of goods shipped.

Writers treat the subject of inspection in a variety of ways. The most logical place for the performance of this function seems to be as a separate unit of the facilitation department. Some writers think that, for certain concerns, the inspection function should be directly under the control of the procurement manager or, in some cases, the chief executive. In a sizable concern, this would be poor organization for reasons set forth previously. Fundamental functions should be kept separate in assigning duties, as far as this is possible.

Goods may be inspected for a variety of purposes, among which may be mentioned: quantity, or number of units; quality, or physical, chemical, or other properties of the goods, as color, fiber, grain, or finish; dimensions, or accuracy of fit, form, or other dimensional quality. The work of inspection may be divided according to purpose, according to stages or a combination of these. This latter phase is the one treated here.

Inspection of goods purchased is concerned primarily with the receipt of goods which have been bought from vendors. When goods are received they should be checked for quantity by the receiving agent. Accounting methods differ widely in respect to the receiving of goods. The best practice seems to require the inspector to indicate on an invoice, on which prices and quantity are omitted, the number of pieces received. This invoice is compared with the original invoice and the purchase order to see if they agree. Identification tags are attached to the goods. As soon as the receipt is proved with the purchase order, the goods are given such other inspection as the pro-

cedure of each concern requires. For example, coal used for heating purposes may be tested for heat units and other chemical properties, as sulphur, fuel, etc., that will not burn in particular furnaces.

Goods are sometimes damaged in storage so that before they enter into the manufacturing process it may be necessary to inspect them. Many types of goods, materials, or stores should be inspected carefully at this stage to insure best results in manufacture. Chemicals, for example, are sometimes of a nature that the constituents change. Steel may rust and be rendered unfit for specific uses.

In modern manufacture, many kinds of goods are inspected at frequent intervals in the process of operation. Such inspection is often a requisite to the control of quality and may serve as a vital link in accounting for wages. The use of highly accurate machines and proper inspection may serve to bring the parts to assembly so that few parts fail in assembly through any defect of the parts. This may be said also for parts produced by highly skilled piece workers. After the goods have been assembled they must pass final factory inspection before they go into the stores. Before goods are shipped they often require final inspection to see that they are in proper condition and packed correctly.

Storing as a Facilitation Function.—Not only must goods be bought and inspected, but they must be stored also before the fabrication process starts and after it is finished. It also consists of the storing of tools, equipment, small stores, etc., that may be removed easily. As the term is used here, it includes:

1. Raw materials.
2. Semi-finished parts.
3. Finished parts and finished goods.
4. Small stores.
5. Tools and equipment, easily movable.
6. Protection and care of stores.
7. Packing, shipping, and delivery.

In a large business, this phase of the work will require subdivision and specialization. Writers have devoted books to several phases of storing. From the viewpoint of accounting and of management control, the subject may be treated as a whole.

Traffic as a Facilitation Function.—Traffic has to do with the documentary work connected with shipping goods. The traffic department is vitally interested also in the classification and description

of shipments; routing shipments; packing methods; rate quotations; verification of rates, etc., to insure accuracy of payment; claims for loss, damage, and overcharges; tracing shipments; preparation of bills of lading; the prevention and handling demurrage claims and charges, and rate structures and practices. It is concerned with inbound as well as outbound shipments. The exact nature of the work to be performed by the traffic agent will depend upon the nature of the shipping problem and questions of internal organization. For this reason, the treatment here is confined to the functional viewpoint.

Facilitation Control.—The basis for the control of the facilitation function is the budget and ways and means for making it effective in use. Each separate unit under the direction of the facilitation manager requires the assistance of accounting methods which are somewhat different from the other units. The facilitation manager is able to apply executive action so as to keep the several phases of the work in harmonious working relations with each other. These relations are recognized in the tentative budget and authorized by the approved budget. Records and reports are necessary to keep the management informed of the progress of the work and to indicate, in many cases, where executive action is needed to keep the several phases of the work coordinated.

Records for the Purchasing Agent.—The work of the purchasing agent may be grouped into four main stages and a record provided for each stage of the work. First, he must be informed of the goods wanted. A "requisition for purchase" should be presented to him as the basis for the purchase. The requisition may be authorized by a production schedule, the maintenance unit, the balance of stores clerk, or some executive. The procedure should be set forth clearly in the standard practice instruction book. Second, a record of some convenient kind should be kept to enable the agent to determine easily where the goods may be obtained. A commodity card index may be kept for this purpose. These cards may refer also to the catalogue file. Third, the agent must select the concern from whom the goods are to be bought. A request for quotation record should be maintained in convenient form. These quotations should be compared by the use of a concise record and the vendor indicated thereon. Fourth, the purchase order serves as a convenient record for the order. A follow-up record is also a valuable part of the purchasing agent's equipment. Other records are to be found in use in particular businesses.

The requisition for purchase and the purchase order are important accounting documents or records. The basic information which each of these documents should contain is as follows :

<i>Requisition for Purchase</i>	<i>Purchase Order</i>
Serial number	Serial number
Date	Date
When goods are wanted	When goods are wanted
To whom delivery requested	To whom delivery requested
Specifications	Specifications
Quantity and quality	Quantity and quality
Signature of requisitioner, duly approved	Signature of purchasing agent, duly executed
Account to be charged.	Prices to be paid
	Route.

The requisition for purchase serves as an order for the purchasing agent while the purchase order serves as an order for the vendor. The particular procedure to be followed is largely a matter for the individual firm, so long as the principles are satisfied. That is, these documents should give adequate and reliable information for the purposes of management and accounting. The purchasing and the inspection agents and the accounting department should have adequate copies for their purpose.

Records for the Inspection Agent.—The principal records necessary to aid the inspection agent to perform his functions are as follows: the inspection order, purchases exception blank, inspector's rejection order, and other special records.

The method of inspecting and accounting for goods received was indicated above. Records should be provided for further inspection and tests. These inspection records should show the goods that pass inspection. This may be done by character checks made upon the purchase order and the inspection order, which are compared as the goods are inspected. The inspection order is an exact copy of the vendor's invoice. Significant variations between the two should be stated, and the record should provide ample means for identifying the vendor's invoice and the purchase order. Goods which are being inspected before entering manufacture may be recorded in a similar manner, except that a requisition for stores is used instead of an invoice.

The inspection of goods in process, finished goods, and goods shipped may be reported by means of a record which shows the goods which have passed inspection at each stage of the work, which goods

have failed to pass inspection, and the reason therefor. The causes for failure to pass inspection should be assigned by the inspector to its proper sources. This failure may be due to one or more of a number of causes, some of which are: fault of the instructions, fault of the materials, fault of the operator, fault of the machine, tools, and other reasons enumerated previously.

Records for the Stores Agent.—The principal records used by the stores agent take the form of orders and requisitions. As soon as inspection is completed the goods pass into stores from which they are issued against properly drawn requisitions. Since the stores are varied in nature and are to be used for a variety of purposes, it is necessary that the requisitions should recognize (1) goods to be charged to orders or processes; (2) small stores to be charged to orders or to processes or to overhead expense; (3) tools and equipment kept in store; (4) goods sold; (5) goods damaged, obsolete, or which for some reason should be charged off to some expense account. The bookkeeping and accounting features connected with these requisitions are treated elsewhere.¹

The records dealing with the expenses connected with the work of the stores agent take the form of wage records, vendor's bills, etc., which are duly approved by the designated officials, paid and charged by the accounting department to accounts operated for the stores agent. This is true likewise for certain types of expense records for each executive in the facilitation department.

Records for the Traffic Agent.—The principal accounting records used by the traffic agent, which originate with him, are: the bill of lading for outward shipments and claims for losses, damages, and overcharges connected with transportation. Records which originate in other departments and require traffic information are generally sent to the traffic department for the necessary information. Much of the information kept in the files of the traffic department is not directly related to accounting information. Such information does, however, enter accounting records in one form or another. To illustrate: rate (tariff) books are used in quoting rates and in checking bills. The classification and description book is used in connection with the rate book to secure the lowest rate practicable.

Executive Reports.—The several records used by the management in the daily conduct of business form a detailed account of the operations. A multitude of details tend toward a lack of ability to

¹ Chapter XXVIII.

determine significant general trends. One purpose of a report is to present a summarized and classified analysis of many details in such manner that "truly significant" information is obtained. The exact nature of the information that should be available to the facilitation executives is a subject for study and evaluation in each particular case. Something of the general nature of these reports may be indicated.

Each executive is interested in a report showing, in comparative form, the relation between his expense budget and his expenses with proper indication of significant variations. The same type of report should be available for significant items forecast. Following are some of the most important of these reports.

Purchasing Agent's Reports.—The budget of sales is translated into its constituent parts, from a production standpoint, by the production department. The purchasing agent, assisted by technicians, forecasts the prices at which the commodities can be purchased when required. This forecast gives due consideration to the general policy of forward buying, etc. A general idea may be gotten of certain phases of the agent's efficiency by comparing the relation between the forecast of prices, the prices paid, and the price quotations given by recognized publications. Such a report upon the principal items purchased may be prepared easily and furnished to the management with other significant information. Indices of the principal items required may be constructed for the purpose of a reasonably accurate comparison of these three items; namely, forecast of prices, actual prices, and price quotations.

Inspection Agent's Reports.—The records prepared by the inspection department should be summarized to show the goods inspected. Goods accepted, goods rejected, the causes for rejection, and the placement of responsibility for rejection are significant facts which should be reported. The inspection agent, assisted by technicians, may be able to render an important forecast of the failure of goods to pass inspection. Such a forecast for particular goods will enable the planning department to make reasonably accurate allowance for failures. This forecast will also enable proper allowance to be made in cost computations and in salvage and reclamation work.

Stores Reports.—The stores agent and higher officials require some knowledge as to the work performed by the stores organization. Statistical knowledge of the receipt and the issue of the several classes of goods and the classes of work performed by the department should be significant information for the management. In like manner, re-

ports on the breakage, damages, and obsolescence of stores serve important management purposes.

Traffic Reports.—In a sizable concern, the money disbursed for transportation may be a significant item in the expenditures of the concern. Careful research and study may indicate that large savings can be made in these costs. A forecast of costs for inbound and outbound shipments should be made and compared with performance. This may be done in such manner as to emphasize the necessity for and the advantage to be derived from improvements in methods. A forecast of shipping losses, damages, and overcharges, together with performance reports, may be instrumental in emphasizing the necessity for a variety of changes. To illustrate: a pottery manufacturer had suffered considerable losses in shipping for a number of years. Better packing reduced these losses, but they still amounted to a considerable sum yearly. A thorough study of the situation revealed that a slight change in design would possibly reduce the loss by over fifty per cent and without an increased production cost or detracting from the design. The change also promised to increase the life of the article in use, all of which was realized, to the advantage of the consumers and the manufacturer.

Internal statistical information relating to the other services performed may be of considerable utility, if reported properly. Some of this information relates to route information, rate quotations, bills of lading furnished, bills audited, claims made, claims allowed, and claims in process. This information should be of value in appraising the work of the traffic department.

Relation between the Facilitation Departments.—The relation between the facilitation departments must be one of harmony and full cooperation, if best results are to be secured. The close interrelation of duties is such that chaos will result unless cooperation exists. To illustrate: the inspectors may cause serious disruption of the work of the facilitation department by too rigid or too lax inspection of goods while in the possession of the facilitation department. To avoid this and other dangers of non-cooperation, the duties of each official and employee should be stated clearly in the standard practice instruction book of the particular business, and adhered to by all.

Reports for the Facilitation Manager.—The principal reports for the facilitation manager should be in the form of a combined budget and performance report for each executive under his direction. This helps him to view the work as a whole. Any additional infor-

mation may be secured from the more detailed reports of the minor executives. Special reports are required sometimes to cover phases of the work not considered of enough importance previously to warrant a special feature in the reports.

Hourly, daily, or other short periodical reports are required often to cover certain phases of the work. Monthly reports serve a highly useful purpose, but for the purpose of executive action these reports may be too late to influence results. To illustrate: one concern issues an hourly report to certain of its executives which shows the status of the work in process; that is, the work ahead of the inspectors, the goods accepted and rejected by the inspectors. They know also the status of the inventory. This enables them to apply the proper executive action in a very short time after performance falls short of what they expect. They know the requirements for each phase of the work and can take the proper steps to see that nothing within their power interferes with production. This procedure helped to double production in a short time. A somewhat similar procedure enabled the Holt Manufacturing Company¹ to maintain work on an exact schedule, established five months ahead, for more than two years without failure.

¹ See Bulletin of the Taylor Society, Vol. IX, p. 260.

CHAPTER XX

ACCOUNTING AS AN AID TO THE MANAGER OF PERSONNEL

Organization for Personnel Control.—For purposes of analysis and treatment, personnel work may be divided along lines which a sizable concern may require for best results. The general title, manager of personnel, is used to indicate the executive in charge of the

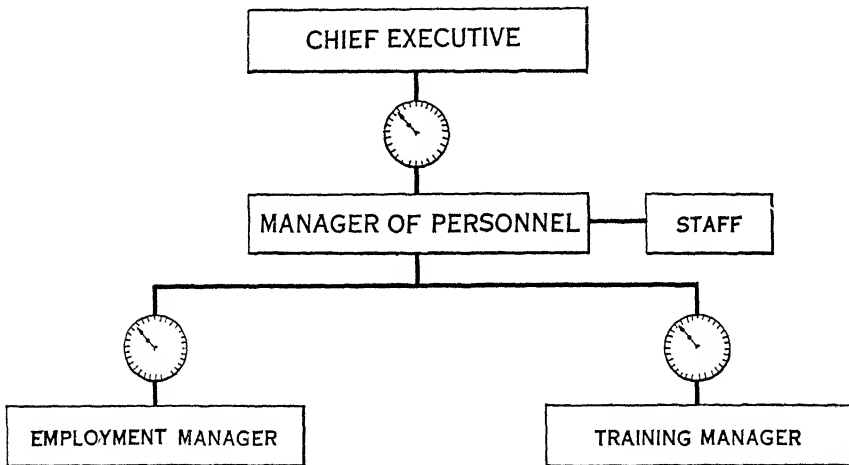


Figure 24. Organization for Personnel Control.

broad function of personnel. Figure 24 shows the manager of personnel as an executive who is coordinate in authority with the manager of marketing and other executives mentioned previously. The employment manager and the training manager each has his respective sphere of activities, which are coordinated and controlled by the manager of personnel. In some businesses the personnel work may be of such a nature that each of these departments may require further expansion and new departments added. From the accounting and the management points of view, the several phases of the work may be performed by an expansion of the personnel of the organization. The interrelations of personnel work to other phases of management

should be recognized clearly. For example, the functions of accounting and the work of the accounting department must be recognized. If this is not done, the functions of accounting will be performed largely by other than the accounting department. The same is true of other phases of management. Such staff assistance as may be desired may be supplied as conditions require.

The Relation of Accounting to Personnel Management.—Accounting in its broader phases may serve to aid personnel management in the performance of its functions. Accounting, by its very nature, is destined to be of much utility in establishing the science of the various phases of management. The trial and error process in business, if conducted properly, has a very large place for accounting. Through the accounting tool, results may be forecast, the results recorded, and the reasons for any discrepancies determined. Management originates, but without the aid of proper accounting a scientific basis for deduction is absent. Without proper accounting the management may originate “down” as well as “up”; that is, the results of good experience may not be fully appreciated and utilized, or vice versa.

There is no uniformity of opinion among controllers and personnel managers as to their relationships. In like manner, there is no agreement as to the differentiation between personnel records and between accounting records. The controller seems to be contented, in many cases, with “treasurer’s information”; that is, information to support payments of money. This seems to be a very narrow point of view. When it comes to cost accounting, the alert controller can immediately see that he is vitally interested in all phases of “cost accounting.” If he could show that large wastes resulted because labor costs deviated from a reasonable standard, he would be well pleased with his work. The same would be true if a similar finding could be made in respect to materials and to equipment.

Since accounting is interested in explaining causes for variation in cost, it must interest itself in all the basic information that will aid in explaining variations from standards. Accounting is interested also in standards. These relationships indicate that accounting is closely interwoven with personnel management. It is vitally interested in those phases of personnel work which affect standards and records, as well as their substantiation, presentation, and interpretation. In practice many records are considered as strictly personnel records, while in their strictest sense, they are necessary accounting records. To illus-

trate: a doctor's examination record before an employee secures employment, as well as later, may greatly affect the liability of the concern in a case involving compensation for industrial accidents and diseases. Other illustrations could be cited to show that accounting is so closely interwoven with many phases of personnel work that the mere record of financial facts is hopelessly inadequate accounting information.

The Relation of Accounting to Personnel Specifications.—

Personnel management is vitally interested in job analysis and personnel specifications, though this work is not a true personnel function.¹ It should, however, be carried on in consultation with the manager of personnel. Every job should be analyzed not only from the point of view of what has to be done and how, but also what the requirements are for the personnel. In some respects, the preparation of personnel specifications is as difficult a task as the analysis of the job.

Job analysis and personnel specification work is sometimes carried on in the form of a "mental analysis." That is, the person who makes the analysis has little or no scientific data for his guide. He used his "common sense." By a process of trial and error, progress in the sciences and arts is made. If the trial and error process is to make rapid progress, accounting data must be used. One great difficulty that is often faced by those who wish to secure certain classes of data is that none are available. A characteristic of many executives is that as little information as possible be recorded. They have never really stopped to analyze their problems in such manner that information of a highly valuable character will become available for use. The research and analysis worker often has to build up his own data. Efficiency engineers often criticize the lack of accounting and other data that may bear vitally upon their problems. Accounting has been and is now in general practice exceedingly lax in requiring more and better basic data. To illustrate: the pay roll lists the names of those to whom money is paid. A further analysis may show the "distribution" in all of its ramifications; but what records are available to show what was to be done, the performance, and any significant causes for failure or for achievement? If accounting is to serve its highest purpose, it must furnish information that will make the foregoing possible.

¹ See A. A. Knapp, A. M. A., Ann. Conv. Series, No. 60. (Note: Since two or more major management functions are involved, such questions must be settled in conference.)

At the present state in the science of management, there is little wonder that accounting data furnish so little information that may be used in the scientific selection of employees from pertinent personnel specifications. Accounting has been looked upon by many as the "classifying and recording of actual facts." The facts recorded, however, were of such nature that little of value was obtained for establishing the science of management. Few managers would deny that material specifications form an integral part of a well-organized accounting system. Personnel specifications are as important, if not more important, than material specifications.¹ If accounting is to be of the best service to management, it must assist in this important phase of accounting.

The first stages of personnel specification work is carried on largely by sight-comparison and sight-appraisal. These appraisals should be recorded and the performance checked with the appraisal. A properly devised accounting system should provide for the accumulation of experience data in comparison to the appraisals. Only by such careful accounting can the science of management be built up.

Personnel Specifications.—The specifications of the personnel are as varied as there are jobs of different kinds. Many jobs have much in common from the personnel viewpoint. For example, a large number of jobs in a factory may call for a minimum of grammar school and a maximum of high school education. Each job should be analyzed, appraised, and classified.² The several positions should be classified in such manner that the classification may be used in the compensation plan discussed later.

The personnel specifications should set forth, among other things, the description of the position and the various qualifications which the employee should possess. As far as possible, these qualifications should be specific and set up so as to show the minima, and, in some cases, the maxima qualifications. On the basis of these data, experience should be recorded. The types of experience that should be recorded are many, but the chief data should be definitely linked to the accounting system.

Compensation Administration.—The personnel function is vitally interested in the administration of the compensation plan.³ Much has

¹ "Employee Specifications," *Industrial Management*, 1924, p. 115.

² "Hiring and Firing," pp. 19-23, Frankel, L. K. et al., Metropolitan Life Insurance Company, 1918.

³ See E. O. Griffenhagen, A. M. A., Office Ex. Series, No. 17, and bibliography for this chapter.

been written about various phases of compensation plans,¹ production incentives, and other phases of the subject. For the purpose of this discussion, two compensation plans are recognized. They are (1) the salary basis and (2) the various other wage plans. In either case, the personnel and the job specifications are desirable. The principal difference between these two classifications is that in the one case the compensation is fixed and in the other case it is variable.

The present tendency in compensation plans is toward "equal pay for equal work." The employer who employs two or more persons to perform relatively equal work at unequal pay or low pay is courting retaliations of one kind or another. To avoid these injustices, as far as practicable, compensation for work on a salary basis is graded on as equitable a scale as conditions permit. That is, each job may have a number of gradations, each with its standard rate of pay. Differences in the productivity of labor would be recognized by different pay rates. Provision is made for the transfer of employees from lower to higher grades of work. Considerable work has been done by different concerns along these lines, but the work should be undertaken by an enterprise only after proper consideration.²

The compensation for piece-work and other plans presents many of the same problems as the salary basis, but it has complications of its own. These complications arise out of improper job analyses, improper rates, and other factors. These errors must be avoided, as far as practicable, if the best results are to be secured.

Accounting properly used should be able to assist management greatly in the formulation and administration of a compensation plan. In many cases, the proper records are not available at the time the compensation plan is first thought desirable. In this case, proper accounting records and information should be available for use before the compensation plan is formulated. Experience with the plan should be recorded in such manner that reports may be based thereon to appraise the results secured.

Accounting to Aid Medical and Health Work.—Many businesses today have well-organized medical departments to attend to the medical and health needs of their officials and employees. Some concerns require a physical examination before employment, and periodical examinations thereafter. There are numerous other phases of the work. Accounting is interested in the larger phases of this work.

¹ L. P. Alford, Editor, *Management's Handbook*, Section 31, by E. S. Cowdrick.

² *Ibid.*, Griffenhagen, pp. 22-26.

Budget and achievement records and reports should be available to show the significant features of the work. Certain of these records will be kept in financial terms, but these do not furnish all of the accounting information which is needed for an intelligent appraisal of results. A well-classified list of accounts should be kept to record expense and asset items. To form a better appraisal of the work, various internal statistical data must be collected which will tend to show whether the results secured are commensurate with the outlay. In most cases, the full utility of the medical and health work done by a concern cannot be appraised accurately. This should be no excuse for the lack of a comprehensive appraisal of the work done.

Accounting to Aid Safety Work.—The loss in wages in the United States in 1923 due to industrial accidents is estimated at over one billion dollars.¹ The incidental cost of such accidents is estimated at four times the direct loss.² The compilation and use of records and reports to show the causes for accidents is one of the most effective means for reducing such accidents. One company reduced its accidents twenty per cent in a year by intelligent action on the results shown by records.³

The basic data which should be secured for each accident, as given by Mr. Hackett,⁴ are as follows:

I. Facts as to the injured persons.

- | | |
|-----------------------|------------------------|
| 1. Check number. | 7. Number of children. |
| 2. Name. | 8. Nationality. |
| 3. Address. | 9. Language spoken. |
| 4. Age. | 10. Occupation. |
| 5. Sex. | 11. Department. |
| 6. Marital condition. | 12. Foreman in charge. |

II. Facts as to accident.

- | | |
|----------------------|--------------------------|
| 13. Date of injury. | 19. Cause, contributory. |
| 14. Day of week. | 20. Nature of injury. |
| 15. Time of day. | 21. Extent of injury. |
| 16. Exact place. | 22. Location of injury. |
| 17. Department. | |
| 18. Cause of injury. | |

¹ *Manufacturing Industries*, Vol. XI, p. 211.

² *Ibid.*, Vol. XIII, p. 49.

³ *Ibid.*, Vol. XIII, p. 189.

⁴ *Management and Administration*, 1923, pp. 649-659.

III. Facts as to time and cost.

23. Length of employment, in plant.
24. Length of employment, at specific job.
25. Witnesses to accident.
26. Probable length of disability.
27. Date of return to work.
28. Number of working days lost.
29. Wages at time of accident.
30. Treatment given by.
31. Amount of compensation paid.

This information may be studied by the statistical method to bring an effective message to the management. In each case the records should be made an integral part of the accounting records.

The ascertainment of the necessary facts about accidents is important, but executive action is necessary to correct the major evils. There is great diversity of opinion as to the responsibility for accidents.¹ Wherever possible, responsibility should be placed. The International Harvester Company is one concern that reduced accidents greatly by a safety campaign.² The Western Electric Company decreased its accidents in one plant from 189 per month in 1923 to 54 per month in 1926 by a safety campaign.³ A relatively high percentage of accidents in many businesses occur in the handling of materials. Mechanical handling, if maintained properly, greatly reduces accidents in handling goods.

Thrift Plans and Stock Ownership.—It happens frequently that a thrift plan is devised which directs the concern to deduct stipulated amounts from the employee's pay and deposit it to his credit in some banking institution. Accounting has a definite relationship to such a thrift plan. Where adequate accounting information is available, it serves as the basis for the management of such plan.

Since 1915 some four hundred corporations have devised plans whereby employees could purchase company securities.⁴ The plans usually provide that the stock can be paid for by deducting a stipulated sum from the pay due the employee. When the amount deducted is equal to the purchase price of the stock, the stock is issued to the employee. Provision is made also for withdrawals and other

¹*Management and Administration*, 1923, p. 650.

²*Factory*, 1926, p. 1027.

³*Manufacturing Industries*, 1927, p. 293.

⁴A. M. A. Ann. Conv. Series, No. 35.

special features. The accounting work connected with such stock purchase plan is simple in principle. As in the case of thrift and other personnel work, the appraisal of results is usually difficult. This is why many controllers content themselves with statements of "facts."

Many executives believe that thrift plans and stock ownership help their business in that it secures more and fuller cooperation and contentment of the personnel. As in other phases of personnel work, few reliable records are available to show definite results. Too many managers are so busy applying their art of management that they have no place for the science of management. Unless accounting secures the necessary facts and the controller and the management are able to interpret them properly, the past will yield little of proven value to business.

Insurance of Personnel.—The question of insurance for personnel is a live topic for discussion by managers. Some of our large corporations have a number of kinds of insurance for the benefit of their personnel. Many state laws require compensation insurance to be carried for certain kinds of employees. Life insurance is also becoming popular. For example: one concern provides \$1,250 of life insurance for each employee after three months of service. The employee may take out a like amount at low rates.¹ Some of the larger concerns carry their own employee insurance. The statement of the proper liability for such insurance becomes an important accounting matter.

The appraisal of and the interpretation of the policy of a concern regarding insurance is often a difficult matter. In many cases, research and study will assist materially in a valid appraisal. As in many other phases of management, the appraisal of policy regarding insurance is a difficult task, and for that reason the accounting methods employed should be of the highest character, if the science of management is to progress.

Recreation and Vacations.—Vacations with pay is a growing practice in this country. The *Monthly Labor Review*² states that a survey of some 250 firms, employing 260,000 people, shows that about one-third of the firms grant annual vacations with pay to their personnel. In a survey of Cincinnati, one firm was found that had given vacations for sixty-six years and another for forty-nine years.³ The survey covered 111 firms. The details connected with the man-

¹ A. M. A. Ann. Conv. Series, No 60, p. 9.

² 1926, pp. 1-7.

³ *Bloomfield's Labor Digest*, 1926, p. 3527.

agement of the vacations varied widely.¹ In some cases the plant is closed for the vacation period. A typewriter company closes the plant for the first two weeks of July, in order that employees may take vacations. The executives think this is the most effective plan for their concern.²

Executives have widely different ideas as to who should pay the cost of vacations. Some executives say that in effect they withhold part of the money of employees and pay it back for vacation purposes. Others claim that the payments come out of company earnings, while others claim that they add it to the price of the goods.³ These views ignore the possibility that the increased contentment and efficiency of workers may offset the vacation pay. There is considerable proof that a vacation does help the efficiency of workers. Before the executive extends the vacation very materially, it would seem advisable to test its effectiveness in the given business. Several concerns have expressed the belief that their executives do better work in an eleven months' year than a full year. More hours are spent in actual work and more concentrated effort is put forth. One executive is convinced that his concern has secured a large number of high grade executives and clerical workers as a direct result of a liberal vacation policy.⁴

Many managers have been impressed forcefully as to the advantages of recreation as a stimulus to production. A number of firms which have experimented with several forms of recreation have found that the time taken off for recreation was more than offset by higher production. At the same time absenteeism and turnover were lessened considerably. Various forms of recreation are found in business. The baseball teams of a number of concerns provide amusement and recreation for the employees and their friends. Tennis courts, swimming pools, libraries, and numerous other facilities are provided for the recreation of employees. Rest periods during the day have proved effective, in a number of cases, in increasing production and in lessening fatigue.

Few records have been kept which attempt to show the results secured by recreation policies and vacation policies. The executive views the situation and decides whether or not the results are "gratifying." Little or no effort seems to be made to secure reliable facts to

¹ A. M. A. Ann. Conv. Series, No. 46.

² Corona Bulletin, June, 1925.

³ A. M. A. Ann. Conv. Series, No. 46, p. 18.

⁴ A. M. A. Ann. Conv. Series, No. 46.

show the results obtained for the money expended. In many cases the results are quite intangible. This is not always true, as may be proved by the smoothing out of production peaks by relaxation and rest during working hours. To illustrate: a factory employing girls found that production was increased about twenty per cent and the quality of the work raised as a direct result of rest periods.

Other Personnel Functions.—There are several other types of activities which are considered by many executives as personnel work, some of which are: suggestion systems, commissaries, factory discipline and morale, sickness and other emergency relief, plant publications, rest rooms, lockers and wash rooms, and other phases of the work which have to do with human relations within the plant.

In the case of suggestion systems and cooperative stores, accounting may be of a definite aid to management. In many other cases the results in general are quite intangible. It is sometimes very difficult to appraise the results secured from a suggestion system. Many suggestions show that the management is negligent in failing to do that which is quite apparent.¹ Some managers prefer to pay a small amount for suggestions of a miscellaneous character rather than go to the expense of personal or staff investigation to ascertain what needs executive attention.² Suggestions are so varied in nature that a suggestion committee is usually necessary to administer suggestions satisfactorily.³ Where the suggestion system is handled properly, it is a demonstrated fact that workers do think and some of their thoughts are very worth while.⁴

Accounting is interested in helping to evaluate the worth of suggestions. In many cases the suggestions are meritorious inventions. What is the improvement worth? This question may be answered satisfactorily by the application of the accounting method to the given problem. It appears that the committee should be able to appraise each suggestion accepted without more information than should be obtained before the suggestion is accepted. Such valuation seems desirable. It will assist materially in appraising the wisdom of the work. How much money should the person receive who makes the suggestion? This is largely a matter of opinion. Personal recognition and a comparatively small sum of money are powerful in stimulating initiative. To illustrate: the General Electric Company paid its high award

¹ Bulletin Taylor Society, Vol. IX, p. 41.

² *Management and Administration*, Vol. IX, p. 259.

³ *Personnel Efficiency*, 1924, p. 362. Also *Management Bulletin*, June 24, 1926.

⁴ *Management and Administration*, Vol. IX, p. 259.

(\$1,000) for a suggestion which resulted in improving the making of a paper insulated cable.¹

Accounting is of direct assistance in the management of commissaries. To be able to trade at many company commissaries is a valuable right. In some cases significant savings result, as in the case of the Ford Motor Company commissaries. Besides the general services which accounting renders to management, it may be used to appraise the value of the store to those who use its services. Such information may be used to determine the effects upon the family budget and to emphasize the importance of fuller patronage. Such stores often add appreciably to the purchasing power of the employees. For example, several department stores offer employees from 10 to 20 per cent discount on their purchases and time off to shop.

The duties of personnel men connected with specific businesses vary widely at the present time. Their authority and responsibility are also varied. Some personnel executives exercise only advisory power while others are vested with authority to "manage the personnel"; that is, to hire, discharge, transfer, promote, determine salaries and wages, and many other things connected with personnel work. In summarizing a recent discussion among prominent personnel men, Mr. C. R. Dooley² said:

No one personnel program will fit all situations; in fact it will be different in each business. The personnel head should report to the chief of the organization which he serves. . . . Any plan will work if you have the right man back of it. . . . That in most plants the personnel man is not in a position of command or authority, but of service. He must win his place and not demand it. . . . The personnel man is an assistant to the general manager—he is not a manager himself, although many of them are so called. We need to develop simple yet adequate reports to show the extent and effectiveness of the work. Such reports will guide us in control.³

This emphasizes the necessity for defining the status of the personnel men in each organization.

¹ *Ibid.*, p. 260.

² Personnel Manager, Standard Oil Company of New Jersey.

³ A. M. A. Ann. Conv. Series, No. 60, p. 19.

CHAPTER XXI

ACCOUNTING AS AN AID TO THE EMPLOYMENT MANAGER

Organization for Employment Control.—As in all other phases of management, the size and the type of organization required will depend upon the nature and the extent of the work to be done. In a large corporation the performance of the employment functions requires an employment manager and additional personnel. The exact nature and extent of the work to be done should determine the scope of the employment activities of each enterprise. The employment function, as a part of personnel work, has come to be recognized by executives as a very essential part of the management.

The status of personnel men in various enterprises, however, is not the same. The nature of the particular business, the several qualifications of the personnel man himself, and the duties and responsibilities that the chief executive may place upon him are all factors which affect his status. In all such cases, great care must be exercised to see that the cross currents of authority and responsibility are at a minimum. For purposes of analysis and treatment the functional point of view is taken herein. It should be remembered, however, that in particular businesses conditions may not permit of an extensive organization. In each case, the assignment of duties should be made in such a manner that the principles of good organization will be followed.

Certain Organization Interrelations.—The question of interrelations between personnel officials is sometimes perplexing. This is likewise true for personnel men and other executives in the enterprise. The relationship between medical and health work and employment must be one of cooperation. Each function is a service function. The employment officer should use the several data to interpret the policies of the enterprise. Since no official is sufficient unto himself, a spirit of cooperation should exist. Executive pressure may be required sometimes to secure it. Unless such cooperation is secured administrative policies will fall short in effectiveness.

The Relation of Job Analysis to Employment.—Job analysis has to do with ascertaining all pertinent facts bearing upon jobs.¹ Personnel specifications should be drawn up to show the qualifications of personnel to fill the jobs. Thus job analysis bears a close inter-relationship with employment through personnel specifications. The employment manager interprets the needs of the business for personnel through his knowledge of qualifications required for given jobs. As soon as vacancies occur or new positions are created, the employment manager will be informed of the required personnel speci-

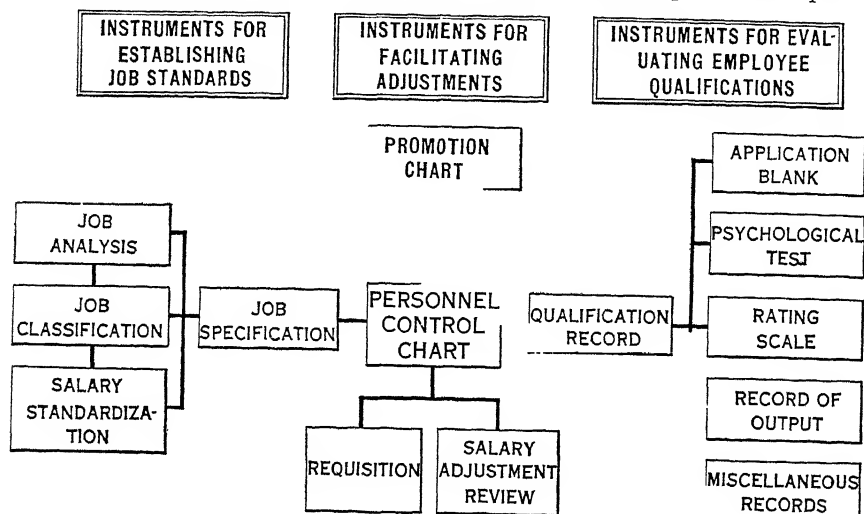


Figure 25. Instruments Used in Personnel Work.²

fications. With this information in hand, he may secure the person or persons who may prove most worth while for the proper executives to interview.

Instruments Used in Employment Work.—The principal instruments used in employment work may be represented by Figure 25. The proper use of these instruments should facilitate employment work and make for better results.

Tests and Measurements.—Because of the many difficulties involved and the unsatisfactory results secured from older employment methods, some concerns have set about to devise trade and other tests which will assist in the selection process. Where tests can be devised which can be applied in practice, the older evils in selecting employees will be reduced greatly. The principal instruments used in evaluating

¹ See Taylor Society Bulletin, Vol. XII, p. 478.

² Taken from "Instruments Used in Personnel Administration," by H. B. Bergen, in *Personnel*, August, 1927, p. 32.

the qualifications of prospective employees are: (1) application blanks, (2) psychological tests, (3) rating scales, and (4) various types of records and reports.

Mr. Bergen says that "application blanks should be designed to yield significant data concerning characteristics which will have a bearing upon the applicant's satisfactory and successful incumbency of any given job."¹ The Bureau of Personnel Research of the Carnegie Institute of Technology made a study of seventy application blanks. Its published report of 1922 shows that the blanks agreed only with respect to the applicant's name and his marital status. The general application blank is seldom able to secure the proper information about the applicant's ability to perform a given job. For this reason, other forms of information are essential to intelligent placement. Psychological tests may be used to supply certain information about the applicant. If these tests are developed properly, they may be of considerable assistance in placements. One concern developed a test for selecting girls to sort jade which met with considerable success. Dr. A. M. Ruggles² has developed some tests which he believes are useful in the determination of the aptitude necessary for clerical workers. Mr. E. J. Bengé has developed a business ability test, and he believes that failure in the test almost invariably implies failure on the job.³ Dr. D. A. Laird has done considerable work in devising mental tests and in demonstrating that some employment policies followed by concerns are erroneous and will not survive properly conducted laboratory tests.⁴ Other research workers have developed tests which have proved useful in the selection process. The rating scale is another means by which applicants may be selected and promoted. The personal interview as a means of rating applicants has many pitfalls. Twelve sales managers rated fifty-seven candidates for a position as salesman. The results secured were little better than guesswork.⁵ In another experiment where the records of salesmen were available as a check upon the accuracy of the rating, it was found that the reliability of the rating was little better than could have been obtained by placing the men's names on pieces of paper and drawing them from a hat—pure chance. Despite the fact that the per-

¹ *Personnel*, Vol. IV, No. 2, p. 31.

² "A Diagnostic Test of Aptitude for Clerical Office Work," 1924.

³ *Office Manager*, April, 1925, p. 71.

⁴ See *Industrial Management*, 1925, p. 372, and *An Introduction to Applied Psychology*.

⁵ *Industrial Management*, July, 1924, p. 59.

sonal interview has many delusions, the average executive uses it almost exclusively in the selection of personnel.

Output and other records serve often as a reliable basis for measuring the qualifications of employees. A well-devised accounting procedure should provide for as much information about given jobs as conditions warrant. Executives are coming to realize more and more the value of individual records. Individual production has been known to increase greatly as a direct result of a knowledge of what the employee is producing. If the concern knows what an employee should produce and the production, it is in a position to correct the causes for failure to attain standard production.

The Problem of Selection.—Who shall select the employee? There is a diversity of opinion among executives as to who should select the worker. Some employment managers select the workers while the executive in whose department the employee works usually makes the selection. The employment manager performs the service of securing desirable prospects and advisory services, while the interested executive decides which of the applicants gets the job. Where the employment procedure has been highly perfected, the interested executive is likely to leave the problem largely to the personnel department. From the functional point of view, the personnel department is the logical department to handle the problem of selection. There seems to be no more reason why the executive should select his own employees than he should select other items that enter into his budget.

Introduction to the Job.—The employment manager, or his assistant, should introduce the worker to the job. There are many ways in which this can be done. One method is to see that the worker is introduced properly to his boss, several of his fellow employees, and the various facilities which he requires. The employment manager has an opportunity to inspire the new employee to make a determined effort to make good with the firm. Its policies and practices that affect the employee should be explained clearly to each new employee. Printed instructions and information should be provided so that the employee may read for himself about the concern and his duties.

Rating the Employee.—Much waste due to excessive labor turnover results from not making a conscious effort to maintain a spirit of "intimate friendly cooperation between the management and the men." Several studies have been made which indicate that about seventy-five per cent of the employees who leave positions leave of their own accord. Of the remaining twenty-five per cent, about one-half are

discharged and the other one-half laid off.¹ An analysis of the causes for departure will furnish valuable data for the employment manager to ascertain the steps necessary to keep desirable employees from leaving the concern.

The use of personal specifications for jobs makes it possible to facilitate adjustments in personnel. The use of the personnel control chart, the promotion chart, the salary adjustment review, and the requisition for personnel, helps the employment manager to make the necessary adjustments in a systematic manner. The personnel control chart gives a perpetual inventory of personnel. The promotion chart indicates the lines along which promotion is to take place normally. The salary adjustment review provides a means for keeping the salary schedule revised properly. These instruments, if used properly, will enable the employee to have more confidence that he is getting a square deal from the management. Such a procedure should be of material assistance in retaining desirable employees.

Transfers and Promotions.—With the introduction of the central employment office came the policy of transfer for the purpose of finding a position for the employee where his productivity is high. Such a policy in the Ford Motor Company reduced the discharges from 8,390 in 1913 to 27 in 1915.² Transfers may also keep desirable employees from leaving of their own free will. If an employee feels that his immediate superior is unfair and prejudiced against him, an opportunity to transfer to another superior may keep the employee from leaving the concern. Transfers have other uses not recognized here.

One of the things that ambitious persons look for in a job is that of proper promotion. If the employment manager misrepresents the possibilities of promotion and advancement in salary, the employee is likely to leave as soon as it is convenient. A liberal promotion policy is considered necessary by many executives, if the right type of employee is to be attracted to and retained by the concern. The types of promotion policies have been discussed previously. The personnel department should handle promotions in as scientific a manner as conditions permit. This will inspire confidence in the department and keep down dissatisfaction among employees which will arise from an arbitrary method in making promotions.

¹ See, for example, Hackett, J. D., "Standardization of Causes for Leaving Job," *Industrial Management*, March, 1918.

² Frankel, L. K., *Hiring and Firing*, p. 7.

Discharges and Labor Turnover.—Where the personnel function is recognized properly, the power of discharge rests with this department. Many executives think that the power of discharge rests with them. The centralized employment department has done away with some of the evils of unreasonable discharges by transfers. Due to the arbitrary nature of many discharges, and the growing necessity for a "fair deal" policy, many executives have come to realize that the personnel department is the proper place for the power of discharge. Some concerns insist on the executive having good causes for requesting the personnel department to remove an employee from his department. If no such causes exist, the executive is required to retain the employee. Policies of these types have done much to humanize management and create a more friendly feeling between the men and the managers.

Occasionally a concern secures an employee whom the concern would be better off without, so that the only prudent alternative is to discharge the employee. This is one cause for labor turnover. Labor turnover has been defined in different ways; the most authoritative one states that labor turnover is defined as the ratio of the number of separations during a period divided by the average number on the force during the period.¹ Thus, labor turnover is expressed as a percentage. To illustrate: if a factory has an average of 500 employees during a year and has 500 separations during that period, the labor turnover would be 100 per cent.

The Relation of Accounting to Employment Work.—The question may be asked: how can accounting aid in employment work? According to a very narrow concept, accounting can be of very limited use in employment work. It might even be confined to records of purely financial character. Such a limitation, however, denies to accounting some of its most useful avenues of service. Accounting, as defined herein, is closely connected with the several instruments used in employment work. It is more closely connected with some instruments than with others. In general, accounting furnishes a basis for the scientific development of many phases of personnel work. For many years, early cost computations were not considered as a part of accounting. As the demands for more reliable costs increased, it became apparent that unless the cost records were made an integral part of the general books, serious errors might creep in easily; just as

¹ Frankel, L. K., *Hiring and Firing*, p. 7; Slichter, S. H., *Turnover of Factory Labor*, p. 9.

serious errors may creep into personnel work unless the work is proved by the accounting method. Accounting must be used with prudence and wisdom if the results are to be of any considerable utility to management.

The relation of accounting to personnel specifications was discussed in the previous chapter. The use to which accounting may be put in employment work may be understood more readily by references to specific phases of the work. How may accounting aid in the development of psychological tests? It has been demonstrated that the most reliable tests are those which bear directly upon the given job. Since accounting is highly instrumental in the development of reliable information concerning jobs, it follows that this information should be of vital assistance in the development of aptitude tests. Tests are made to ascertain a higher degree of success in achieving given results than can be obtained from chance. Accounting is instrumental in helping management to set the goal for attainment. The application blank is usually uniform for a large variety of jobs. If a serious use is to be made of such blanks, they should be devised so that such pertinent information may be elicited from the applicant as will enable the management to decide whether or not the applicant has a reasonable chance of doing the work satisfactorily. The information sought in a rating scale should likewise be subjected to the test of scientific data developed by the accounting process. Other important relations between accounting and employment work are treated below.

Records to Aid Employment Work.—Many employment managers consider the records they use as bearing little or no relation to accounting. To them, accounting begins when the employee is entered on the pay roll. His performance while with the firm is considered a matter which should be recorded on the employment records. A somewhat different viewpoint is that which makes the employment records a basic part of the accounting method and requires these records and other documents to give the accounting system the basic factors necessary for dependability.

Mr. Bergen says:

Records of output are relatively reliable measures of performance. The maintenance of such records, however, is not always possible or expedient. But, if progress is to be made in developing more accurate instruments either for establishing job standards or for evaluating employee qualifications, it will be necessary to develop objective units of measurement of the operations of each job.¹

¹ *Ibid.*, p. 31.

If the necessary records are to be kept properly, it appears that the best way to secure the information desired is to develop the data by the accounting method. As yet little progress has been made in this direction. There seems to be a growing tendency upon the part of some progressive firms to develop accounting records which are of considerable utility in the prudent conduct of the employment function. If progress is to be made in employment technique, the accounting methods employed must be extended so as to give full cooperation and adequate assistance for the work.

CHAPTER XXII

ACCOUNTING AS AN AID TO THE TRAINING MANAGER

The Need of Training for the Job.—Under modern mass production the need for training for the particular job is recognized frequently. To illustrate: other questions taken for granted, trained inspectors are necessary to insure a fairly uniform product. Under the special order type of manufacture, the need for training for the job is not realized so readily. For example: a first-class tool maker may have had no training or experience in the construction of a given type of tool, yet he may be set at the task to get the work out by any methods he chooses. The work may be done better and at less cost if proper training and instruction are provided. This is realized readily where large-scale production takes place. Here the production of employees in places where training is not a part of the program is about one-third of what it should be.¹

Since experienced and trained men need training for particular jobs, it is evident that inexperienced men must receive proper training for jobs if they are to produce goods in an economical manner. If a partially trained man is put to work on a given job, he will not be able to do the job in as economical a manner as he would if he were trained for the job. Bad habits of work may be built up. This leads to a loss of productive capacity. Under large-scale production, the maximum product per employee is turned out, if each employee is selected and trained for a particular job. Gantt says that "one of the most important industrial problems . . . (is) . . . that of training workmen in habits of industry, which are essential for any kind of success."² Besides training for the particular job, mention should be made of the more general phases of training, which are developed later.

Training as a Responsibility of Management.—Society must look to management for the provision of training for the job. Each industry must train the personnel needed to perform the labor in that industry. The public schools, for example, cannot be expected to do

¹ F. A. Parkhurst, *Manufacturing Industries*, September, 1927, p. 173.

² *Industrial Leadership*, p. 48.

this because that is not considered their function. The technical schools can do part of the selection and training, but industry must supply most of the practical training. The employee should not be expected nor allowed to train himself because he does not know the best methods of work. The only economical way that an employee can get the training necessary for a given job is to be taught properly by the management. Then, too, there is the more general aspect of training. Management has a large share of the responsibility for training employees to live happily in an industrial and social democracy. If the management does not go about this task systematically, the employee is practically certain to receive and harbor ideas that are foreign to an industrial democracy. Employees read and think today. If their thoughts and their reading material are allowed to become distorted and there is no source for the light that management may shed on the subject, then management must abide by the consequences.

Organization for the Control of Training.—There is no consensus of opinion among executives as to the particular phases of management that should be held responsible for the training of personnel. Some executives hold that the line executives are responsible for training, while others hold that it is a function of the personnel department and should be performed under the direction of this phase of management.¹ The function of training is distinct from the function of production, sales, etc. The analysis of management in this treatise is along functional lines. Such an organization in business presupposes proper coordination and cooperation.

Securing the Facts about Training.—It is much easier to conclude that certain things are true by supposition than it is by basic facts. Accounting may be of considerable utility to management in setting forth facts about training. Without basic facts, management may drift along indefinitely without knowing whether or not there is a substantial foundation for their opinions. The development of basic facts requires scientific experiment. These experiments should be reduced to records and analyzed so as to show a basis for a training program. It is admitted that such a procedure is not followed frequently, but if scientific progress is to be made in training, there must be some reliable measures of and for the work. The accounting method, used properly, provides a suitable basis for the ascertainment of many pertinent facts about training. Mr. Gantt says:

¹ See A. M. A. Ann. Conv. Series, No. 48.

My experience is that business policies are often as crude as labor policies, but accounting systems as a rule are not so devised as to show such to be the fact. The time will come, however, and indeed is not far distant, when cost keeping and accounting methods . . . will be so changed as to place blame for failure where it belongs, and give credit to whom credit is due. Such a change will do much to help the capable workman toward advancement, and will show most clearly the advantage of proper training methods.¹

This may be illustrated partially by the following:

In one factory which has made adequate provision for the development of skill in workmen there has resulted a decrease in unit labor cost of 43 per cent and an increase in unit production of 98.5 per cent. Results of a similar character have been obtained in other cases, driving home quite forcefully the importance of providing for this essential factor of more skilled labor.²

Does Training Pay?—There has been much speculation as to whether training pays. Some writers think that all types of training have utility in business and should be encouraged. Other writers think that a general high school or a college education would be of great benefit to boys, and this should be acquired before they begin to acquire a specialized course of training. Others think that a minimum of general education should be provided to begin and a suitable amount of specialized training acquired to secure success in a given occupation. The question is: does training pay? If training does pay, how is the rate of return to be computed?

There are several factors to be taken into consideration to determine whether or not training pays. Mr. Frank Cushman says that "training for any job is justified in proportion as the cost factors involved in training can be minimized." He says that the "cost factors" are:

1. Time of person who functions as instructor.
2. Spoilage and breakage.
3. Turnover of learners.
4. Reduced production for equipment used for training.
5. Difference between value of learner's production and wages paid learner.
6. Accident losses.³

In individual cases other factors may require consideration. In any case, only the most important factors should be considered and the

¹ *Industrial Leadership*, p. 40.

² "Training as a Factor in Reducing Labor Cost," J. F. Johnson, *Management Engineering*, July, 1921.

³ *Foremanship and Supervision*, p. 90.

findings duly qualified. The necessary data may be gathered for a representative group of trained and untrained employees. A comparison of the two groups should furnish data upon which to base an appraisal of the value of training.

The rate of return which a concern may secure from a training program may be computed from data obtained from comparison of the "cost factors" secured from representative and comparable groups of employees. Such a computation, however, could be nothing more than an estimate of value because, in many cases, the data required for exact computations will not be available. Such estimates, however, if performed properly, should furnish adequate proof to the executive as to the probable rate of return to be secured from a training program.

Who Shall Be Trained?—Most executives feel that a training program must be justified in the light of the financial position of the concern. This usually means that the funds and energy that can be devoted directly to training are limited. It is then a question of deciding which particular persons or class of persons within the business will show the greatest return to the concern from a definite training program. This question can be answered tentatively from experience in other firms and related fields. Teachers must be trained first because the supply of competent instructors and teachers is limited in business, and teachers are needed before a comprehensive training program can be carried out. The word "teacher" should not be limited to those who spend their time in giving instruction. It includes executives of various kinds, because the executive must spend a considerable part of his time in "teaching." After the necessary teachers have been trained the work may be carried to the several groups of employees, as conditions seem to warrant such a procedure.

The Selection of Prospects for Training.—Unless wisdom is used in selecting those to be trained, the value of a training program may be lessened greatly. Prospects may be selected for training for a number of purposes, some of which are:

- (1) For promotion.
- (2) For more efficient service on the same job.
- (3) For transfer to some other job.

If employees go through the training required and do not secure the benefits that have been advocated, a number are practically certain to leave and go to a concern where promotion seems more certain.

If this process is not carried too far the loss may be more apparent than real, because the more progressive firms have had to educate the less progressive firms to most great movements.

An important question is how to select the personnel for training. There is no "one" way to do this. Mr. F. T. Jones presented "a procedure of general application by which it is possible to make selection for training upon a basis which is reasonable, logical, consistent, and approximately scientific."¹ He summarizes the data under the following:

	<i>Points</i>
1. Personality.....	30
2. Native ability (or present mental status).....	30
3. Experience.....	20
4. Schooling.....	20
	—

It is acknowledged that no accurate measure can be secured for the first two items. Provision is made, however, for ratings for these items. Since final selection is made in practice by the personal interview, the statistics serve as a basis for selecting the applicants who appear to be the most worth-while prospects for the final interview. Mr. Jones suggests that certain data be gathered for the purpose of rating the several applicants. The applicants whose ratings are considered satisfactory are given their final rating by certain executives and selected for training.

The technique given above, or one considered likely to be suited to the individual case, may be used to select the applicants for various types of specialized training. If the proper records are kept, a few years of experience, if used properly, may be able to demonstrate the probable reliability of the methods employed. A comparison of the methods and results secured by a number of firms may point to a procedure which has proved capable of securing the best results. Wherever possible, various techniques should be subjected to the test of results, if progress is to be made in the science and art of selection and training personnel.

The Training Program.—A definite course of instruction for each class of employees selected for training should be provided. The course of instruction should be suitable for the purpose of training men for particular jobs. Some employees need a more intensive and

¹ *Personnel*, August, 1927, p. 11.

thorough course of training than others because of the differences in attainment when selected. Mr. John A. Stevenson¹ says that:

One of the causes of the initial failure of training in life insurance was that training was considered merely class instruction, whereby a certain amount of unrelated information might be imparted. There was not any particular way to find out whether this training was effective or not. There was no job analysis to determine the needs of the people who were to be trained.²

It should be remembered always that the object of training is to produce more favorable results than can be secured without such training. If the course of instruction is not planned so as to help the employee to overcome definite difficulties that will be met on the job, it is not likely to give him the knowledge necessary to do the job in the most effective manner. A general course of instruction, while valuable in many respects, does not provide the employee with the proper technique, the proper point of view, and the practice for the given job.

To illustrate: a course in general salesmanship may be broadening to the prospective salesman, but unless he is given the proper training in the selling of particular goods of a given concern, the training is likely to produce inferior results to that which might be produced under more scientific training for the job.

There is, however, some material which should be included in most courses of instruction because it is considered essential for all employees. The history, the products, the general policies, and some other information should be contained in courses offered in a training program.

Handling the Trained Employee.—Employees who have undergone special training should be given ample opportunity to apply their training and profit from its application. A candid statement as to the promotion that employees may reasonably expect, will do much to dispel discontentment in the event that promotion does not come as fast as the employee believes that it should come. A careful record of the reasons why the trained employee leaves may be of considerable assistance to the management in helping to correct unfavorable conditions.

Tests for Effective Methods in Training.—Educators have realized the needs of tests and measurements to determine the comparative effectiveness of different methods of teaching. Then, too, they have questioned the utility of much of the information formerly

¹ Formerly second vice president, The Equitable Life Assurance Society.

² A. M. A. Ann. Conv. Series, No. 48, p. 1.

thought desirable for children. Management has been slow to take up the same procedure for perfecting training methods and subject matter. Business training is often of a purely informational type. If the best results are to be secured from training, it appears that the material must be tested to see if it is what the employee really needs, and if it is presented in a manner that will produce best results.

The scientific method may be applied to this problem for a solution. Accounting information may be used to provide a considerable amount of data for the problem. If standards for performance are set up and records kept of achievement and causes for variation between standard and performance, these data, when manipulated properly, should be able to show the difference in results secured. From these data, proof may be provided to test the probable effectiveness of various phases of the methods employed. Special records and reports may be necessary to secure the desired information, but until the fundamental phases of training have been tested properly by facts, opinions alone will govern the types of methods employed in training.

Some Recognized Training Methods.—Four types of training methods have been recognized for foremen, as follows: (1) lecture method; (2) conference method; (3) text study method; (4) field training method.¹ For training other classes of personnel, a combination of some or all of these methods may be employed. Each type has its recognized strong and weak points, which are not necessary to the present discussion. The thing that is desired is that the training methods be subjected to scientific proof as to their respective merits for particular uses. The proof which is offered for the strong and the weak points in training methods is that of personal opinions based on mentally recorded experience. While valuable in many respects, it should be recognized that if progress is to be made in training, the methods employed must be subjected to the rigid test of performance. Accounting information may be used to aid in this work.

It has been said that any training method will work "well" if the right man is employed to do the work. It is doubtful if this is subject to scientific demonstration, if it is meant by "well" that the most effective results will be secured. It appears that, up to the present time, consideration has been given only to ways and means for carrying on training programs. This has led to a wide variety of opinions as to results secured. Until reliable data have been secured which

¹ "Foreman Training Methods," by Committee, National Personnel Association, 1922.

will show costs and results secured, training methods will consist chiefly of the art of training.

The results secured from training methods contain four possible variables: the employee, the teacher, the subject matter, and the tests employed. Care should be exercised to reduce the three latter variables to negligible factors. This may be done by a systematic procedure. The variable that is to be measured is the employee. It has been demonstrated, for example, that there is a high degree of correlation between mental ability and skill in shop work in schools. The method employed here is a combination of the demonstrated lecture and the field method. A comparison of the results secured under different training methods, after due consideration of the ability of the employee, should enable the training manager to know the most effective methods to use in the training of different classes of employees. Performance data are largely accounting information and may be used in forecasting the best methods to use in training employees.

The Learning Process.—The processes of learning have been studied by the scientific method, and the laws of learning have been formulated.¹ In planning the training program much experimental work can be avoided by basing the training program upon these laws of learning, as well as other truths that have been discovered by educational psychologists. It is not to be supposed, however, that every program will be of equal effectiveness. This is why experiments should be made to determine the most effective methods of training. Of the hundreds of training programs that are in use in this country the assumption seems to be that they are "satisfactory." Little or no effort is made to measure the effectiveness of the methods employed. This must be done if the training methods are to be the most effective.

Among psychologists the study of the effectiveness of various methods and combinations of methods of training would probably be considered to be aided principally by statistics and the use of analysis and synthesis. Most performance data, however, may be looked upon as in the nature of accounting information. For example, the principal aim in training salesmen is to profit by sales. To a concern with sound policies, the efficiency of a sales force is based largely upon their ability to get and hold business under specified conditions. Under these conditions, the variable is sales—the measuring stick of sales training methods. An adequate analysis of the facts should

¹E. L. Thorndike, *Educational Psychology, Briefer Course*, Chapters X and XI.

reveal the probable effectiveness of a training program. From these data, the program which offers the greatest effectiveness can be pursued with profit to the concern.

Some Cases Where Training Paid.—Many cases can be cited as to the profitableness of training in business. In one case two groups of employees were working on the same class of work; one group was supplied with an instructor and the other group worked as formerly. At the end of twenty-one working days the average output for the period of the group supplied with an instructor was 223 pieces per day; the average output of the untrained group was 131 pieces per day, or an increase of 70 per cent. The output of the group in training increased practically every day, while that of the untrained group remained about stationary.

Shepard ¹ cites a case of a machine operator who performed a job which should have taken forty minutes, and lost about 64 per cent of the time due to lack of training for the job. Properly trained employees can attain standard time.

¹ *The Application of Efficiency Principles*, p. 227.

CHAPTER XXIII

THE PROBLEM OF EXTERNAL COORDINATION

The Business Cycle.—Observations, research, and analysis have revealed that there are alternating periods of prosperity and depression in business. It has been observed that these periods of prosperity, booms, recession, and depression run in cycles. These phenomena are technically known as business cycles. Professor Mitchell says:

From the viewpoint of society booms are wasteful, crises are costly, and depressions are periods of widespread suffering. . . . They indicate that the worst years in the United States fall some 15 to 20 per cent behind our best years in the amount of income received. The worst years also fall some 8 to 12 per cent behind the modestly good years. . . . The business cycle, indeed, is one of the outstanding defects of economic organization based upon money-making. How to control this business cycle is one of the great problems of the world.¹

Some leading business men, economists, and others are devoting considerable thought to the business cycle. The object of such study is to learn what causes these business cycles and to ascertain what may be done to lessen the bad effects of them. Considerable control has already been exercised to lessen the bad effects of the business cycle and to make business more steady.² The strictly industrial and commercial sides of the business cycle still remain largely unsolved, so that further study is essential to a more satisfactory control of business.

Studies of the business cycle have been conducted largely for the purpose of finding out the more or less general characteristics of the cycle. General business conditions have been studied. These studies are valuable as a beginning for a more thorough analysis of the various industries and businesses. For several years, many business men tried to control their own businesses from a knowledge of general business conditions. It was soon discovered that many costly mistakes were being made. If the general trend seemed to be upward, for example, business men in industries whose cycles did not correspond

¹ *Journal of Accountancy*, 35: 161-171.

² *Nation's Business*, November, 1924, p. 42.

to general business would expand operations, when the proper thing to have done was to liquidate or to have avoided expansion. This emphasized the importance of knowing the position of one's business in the cycle, if such information is to be used in management.

Knowledge of Internal Conditions not Enough.—In modern business, a knowledge of the internal workings and position of a business is not enough. A business secures its profits from trading with outsiders. From this it generally follows that whatever affects outsiders also affects the business. If a considerable proportion of the population of a city is thrown out of employment for a considerable period, this will greatly affect many business and other men in that community. Unemployment, low incomes, and many other factors affect the profits of business enterprises. Unless the chief executive knows the probable sales of his concern, for a reasonable period in advance, he is not in a position to make the necessary business commitments intelligently.

Many business men who are thoroughly familiar with the internal workings of their businesses and who can produce goods or services at comparatively low costs, fail because they do not know how to control their commitments properly. This indicates that unless the business man keeps sufficiently informed about external conditions that affect his business, no profit may be realized.

Present Interest in the Business Cycle.—A considerable number of executives have come to realize that, since external conditions may influence so vitally the welfare of the business, the more one knows of such conditions the more capable he will be as a manager. Since business cycles have been found to vary in duration¹ and in severity, many executives have been convinced that a much better understanding of current operations is indispensable to prudent operations. The widespread losses that took place during 1920 helped to convince boards of directors and executives that to neglect a relatively thorough analysis of the business situation was sure to bring large losses.

A more thorough analysis of the business situation has convinced some progressive managers that profits depend largely upon intelligent forecasts and adequate action on the information provided.² A considerable number of directors, chief executives, and managers who paid little attention to business conditions in 1920 were forced to resign in favor of more capable men. The attempt to operate a sizable

¹ *Business Annals*, p. 54, et seq.

² See, for example, J. H. Barber, *Budgeting to the Business Cycle*, p. 108. See also Mills, F. C., *Statistical Method*, Ch. VI.

concern without an adequate forecasting and budgetary control procedure is declared by business authorities to be exceedingly lax in business methods and procedure. These instruments, if properly devised, operated and used, repay their cost many times over. For these reasons, many business men are vitally interested in studies in business cycles.

The Idea of Prediction.—The study of the external factors which affect a business is for the specific purpose of prediction. The idea of prediction is back of science. If predictions can be made more accurate than mere chance, they are of value in foretelling future events. For example, weather predictions twenty-four hours in advance are extremely accurate—over 95 per cent accurate. Business forecasts are not, however, nearly so accurate. Some of them have been known to be less than 50 per cent correct—worse than chance. These results, however, are not surprising in view of the methods employed for particular forecasts and the newness of the science and the art of forecasting. Some concerns enjoy the benefits of relatively accurate forecasts. As time goes on and more thorough methods are employed, it seems reasonable to expect more reliable results to be secured.

Since 1920 a number of large firms have devoted considerable energy to the perfecting of methods and technique for business forecasting. Some of them have succeeded in finding data outside of the business which will enable the concern to detect probable internal changes months in advance of the actual changes. Such indicators of business changes may be of invaluable assistance in the management of the enterprise.

Relation of the Budget to the Business Cycle.—The budget is an instrument to aid in planning future operations. This necessitates a forecast as to what the conditions probably will be in the future. A budget cannot be drawn up with any high degree of probability for attaining it unless future conditions are predicted with a like degree of success. If a budget be drawn up so as to reflect a boom year and conditions in the business do not reflect such a state of prosperity, the budget will be in excess of performance. If budgets are to be taken seriously, the probable effect of outside conditions upon the business should be predicted. It should be remembered, however, that a "general" recession of activity may mean increased business for certain concerns. This indicates that each concern should know how its business will be affected during the several phases of the business cycle.

The Statistical Method.—It has come to be realized by many executives that more and more control of future results must be effected. This indicates that ways and means must be provided to predict the probable course of business over a reasonably long period of time. Just how long this period is will vary with the particular case. Such predictions should be suitable for budget purposes.

The technique for the statistical manipulation of business data has been and is being developed rapidly. Methods for studying trends, seasonal variations, cyclical and random fluctuations have been devised

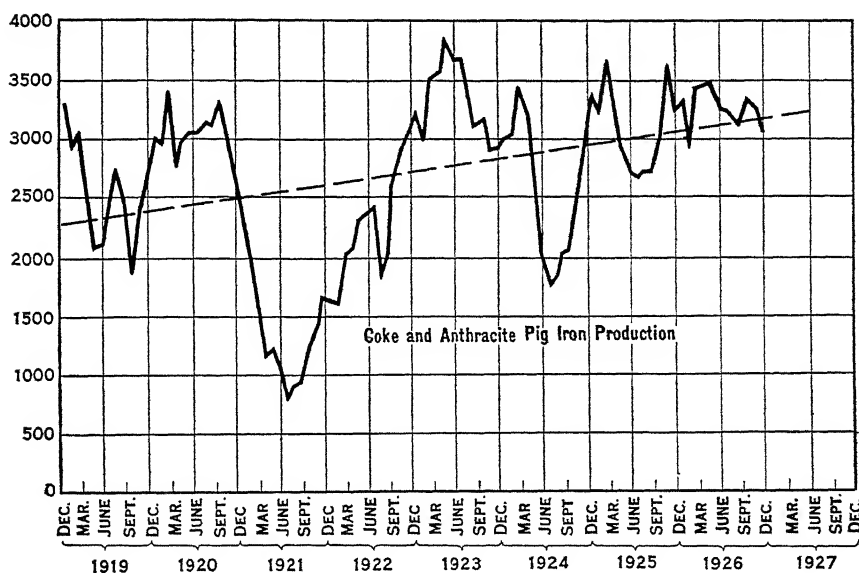


Figure 26. The Trend of Coke and Anthracite Pig Iron Production—
Units 1000 Gross Tons.

so that it is possible to study the probable effects upon the data of these factors. The application of this technique to the study of the problem of forecasting requires technical skill and good judgment, if reliable results are to be expected.

Measuring the Trend.—The trend or long-time growth of a business may be given a statistical measure. The technique for measuring the trend of automobile registration, the shipment of tires, and passenger automobile production is illustrated in Chapters XXIV-XXXI. A knowledge of the growth factor in a business is imperative for many administrative purposes. For this reason, and to illustrate the

measurement of cyclical and random fluctuations, the technique is presented for analyzing coke and anthracite pig iron production.

If a straight line be fitted to coke and pig iron production data shown in Table 25, a line of "growth" will be obtained. The normal

TABLE 25
COKE AND PIG IRON PRODUCTION

Year	<i>x</i>	<i>Thousands of tons Gross</i>			<i>x</i> ²
		<i>y</i>	<i>xy</i>		
1919	- 7	30,582	- 214,174		49
1920	- 5	36,415	- 182,075		25
1921	- 3	16,544	- 49,632		9
1922	- 1	26,877	- 26,877		1
1923	+ 1	40,059	+ 40,059		1
1924	+ 3	30,708	+ 92,124		9
1925	+ 5	37,001	+ 185,005		25
1926	+ 7	39,008	+ 273,056		49
		<hr/> 257,194	<hr/> + 117,486		<hr/> 168

equations for the trend line are:

$$(1) \Sigma (y) = n a + b \Sigma (x)$$

$$(2) \Sigma (xy) = a \Sigma (x) + b \Sigma (x^2)$$

Substituting the values obtained in Table 25 and eliminating, we have:

$$257,194 = 8 a$$

$$117,486 = 168 b$$

$$a = 32,149.25$$

$$b = 639.79$$

Then:

The values for *a* and for *b* may be used in the equation to determine the values for the straight line shown in Figure 26.

Eliminating Seasonal Variations.—The data used above are on an annual basis. Due account must be given to the seasonal variations. To reduce the data used above to a monthly basis, we have:

$$y = \frac{32,149.25}{12} + \frac{639.79}{.72} = 2,679.10 + 8.886$$

This would center at January 1, 1922. To correct for 15 days, we add 4.443 ($\frac{1}{2}$ of 8.886) to 2,679.10 and obtain 2,683.543—the value at January 15, 1922. The value of the data at the point of origin, January 15, 1919, is found by subtracting 426.528 (8.886×48) from 2,683.543 or 2,257.015. With this origin the trend value is shown in Table 26. This table also shows the monthly and yearly production of coke and anthracite pig iron. These data are charted in Figure 27.

The data shown in Table 26, Column 3, are obtained by dividing the monthly values by the trend values. The quotient is expressed as a percentage. The values shown in Column 3 were placed on a fre-

TABLE 26
THE MEASUREMENT OF CYCLICAL FLUCTUATIONS¹

Date	(1) Data Actual	(2) Trend	(3) %	(4) Seasonal	(5) Deviation
1919					
Jan.....	3302	2257.01	146	109	+ 37
Feb.....	2940	2255.89	130	103	+ 27
Mar.....	3098	2264.78	137	114	+ 23
Apr.....	2478	2273.66	109	104	+ 5
May.....	2108	2282.54	92	100	- 8
June.....	2115	2291.43	92	95	- 3
July.....	2429	2300.31	106	95	+ 11
Aug.....	2743	2309.19	119	92	+ 27
Sept.....	2488	2318.07	107	92	+ 15
Oct.....	1864	2326.95	80	95	- 15
Nov.....	2392	2335.83	102	98	+ 4
Dec.....	2633	2344.71	112	103	+ 9
	30582			100	

Etc.

Etc.

Etc.

¹Data for 1920-1926 omitted here.

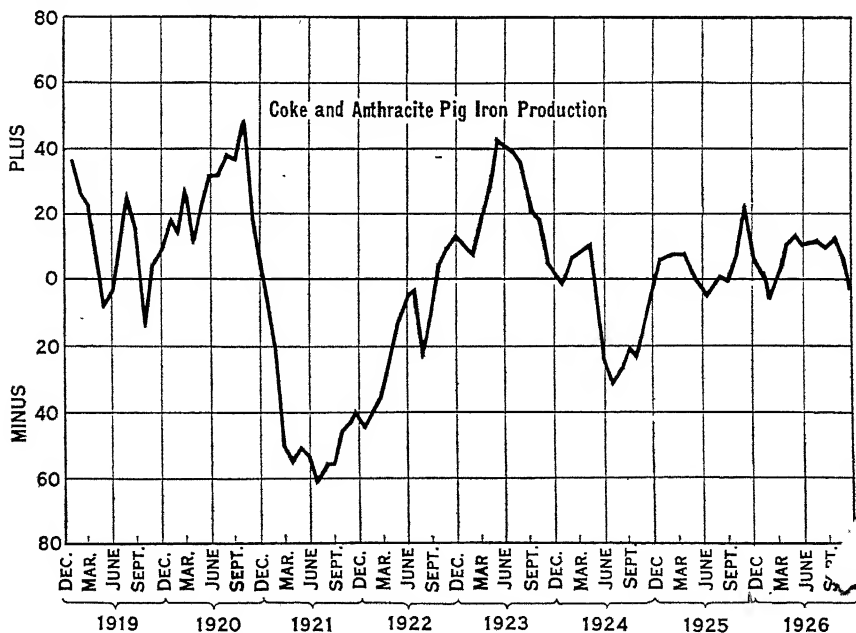


Figure 27. Deviations from Normal of Coke and Anthracite Pig Iron Production.

quency distribution chart. An average of the six central items was used for determining the unadjusted seasonal index. The unadjusted index was then adjusted so that the average monthly value for the year would equal unity. The data shown in Table 26, Column 4, represent the required indices of seasonal variation.

Cyclical and Random Fluctuations.—The deviations from the normal or trend value, after removing the seasonal factor, represent the cyclical and random fluctuations. The values for these deviations are shown in Column 5 of Table 26 and charted in Figure 27. Ordinarily the period studied should be for more than eight years because this is not a long enough period to determine a trend or growth factor.

In the case of the Mileage Tire Company, shown in Chapters XXIV–XXXII, the cyclical and random fluctuations do not appear to be of any considerable importance. In some industries, however, the cyclical factor has been a real problem in the past.

The Problem of Forecasting.—Forecasting for a business in an industry where the business cycle is felt is a harder problem than forecasting for a business like the Mileage Tire Company. The statistical technique for forecasting is not the same because of the cyclical factor. Where the cyclical factor is present, the forecasting procedure must include studies of commodities or some indices which will serve to forecast. These indices must be able to tell the direction, the extent, and the time of probable future changes. This might appear at first sight to be an impossible problem, one to be “solved” by soothsayers and fortune tellers, but it is not. This is just another business problem that has been and can be solved by the scientific method. Some executives and professional men, however, are very suspicious of any one who proposes to foretell future changes in business. These same individuals may have the same idea about the weather forecasts, and other forecasts which are known to have a high degree of reliability. Those who accept predictions made from the application of the scientific method to the solution of a business problem, and act upon them, have more chances to win than they have to lose.

Efforts to Predict in Business.—A considerable amount of effort has been set forth to discover the technique for the study of the business cycle and to predict changes in business conditions. Most concerns who have expended considerable energy in forecasting are too busy harvesting the results to be inclined to write about their successes.

Their attitude about business secrets also influence many in this respect. A number of concerns will describe their techniques privately, but few are willing to have the results of their efforts made public. Those who write about their forecasting methods seldom give illustrations which are taken from their own experiences. An appraisal of results is seldom made public. A number of leading executives acknowledge that forecasting has meant much to their organizations. President Howard Coonley of the Walworth Manufacturing Company, stated, in his 1924 annual report to the stockholders, as follows:

Had it not been for our method of budgetary control, which made it possible to forecast both the decline and increase in orders, thereby maintaining a fairly even production throughout the year, in all probability no profit for the year would have been realized. Our earnings, though modest, were sufficient to add slightly to our surplus after providing for interest—preferred and common stock dividends.¹

Thirty years ago, the furnishing of financial statements as of a past date as a basis for credit and other purposes was quite uncommon. Today a number of corporations furnish their bankers with budgets and forecasts as a basis for loans. It is to be expected that bankers, creditors, and stockholders will not be contented long with the present customary inadequate tools which are furnished them, but will demand and in due time will receive, instruments with which they can gain insight into the operations of a business, the efficiency of its management, and the value of its securities. The forecast is nothing more than most successful business men have been trying to learn from experience. The forecast in business, by the aid of the scientific method, places a most powerful tool in the hands of the administrators, managers, and others. It magnifies business experience and finds truths that the human mind is incapable of finding otherwise. Forecasting is intensely practical. It is a modern business necessity.

The external coordination of the business enterprise involves other questions than those discussed above. The business must be kept in proper relation to legal regulations and the community must be informed of the activities of the concern. These problems are treated in the remaining pages of this chapter.

Business Regulations of Business.—The Jeffersonian school of democracy recognizes that business is more adapted to changes than legal procedure is adapted to changes. As far as practicable this school of democracy advocates that business should rule itself. In the

¹ J. H. Barber, *Budgeting to the Business Cycle*, p. 108.

absence of accepted ethical rules of conduct in business, it has been necessary to establish such rules of conduct by legal processes. One great source of business discomfort in the establishing of rules of conduct by the legal process is that they are not immediate and effective. The business man should know before he establishes a certain policy or enters into a transaction whether or not his conduct will meet with the approval of the community. Positive guidance in business, instead of a negative procedure, would serve to give the administrators and managers of a business a different outlook upon the whole question of the proper relation between the business and its employees, its customers and its suppliers.

The profession of "management," now in its early stages of development, is formulating rules of conduct in business which are designed to bring about the "right" relationship between the owners of a business, its employees, its customers, and the general public. During recent years the Federal Trade Commission and other government executive and judicial bodies have interpreted legal restrictions upon business differently from their former interpretations. The economies which science and invention have brought to business, augmented by many improvements in business methods and procedure and the accumulation of wealth, have brought about such radical changes that the older ideas of how best to regulate business relationships have become antiquated and badly in need of revision. This revision must come of economic necessity.

The administrators and the managers of business enterprises can do much toward guiding the activities of business enterprises along paths of high ethical conduct. When business is so guided, there are few possibilities that legal restraints will bear heavily upon business. The accounting method and its ways and means provide highly useful tools to the administrators and managers for helping them to administer and to execute plans for the conduct of business enterprises.

Business Publicity.—The increase in the size, the complexity, and the extent of the business enterprise has brought with it a complex question of business relationships. The former word of mouth channels of publicity have become hopelessly inadequate for the needs of modern business. New types of publicity have been invented in an endeavor to maintain a satisfactory working relationship between the business and its owners, employees, customers, suppliers, and the general public. Business publicity, then, covers a wide field, has many purposes, and many ways and means for securing the desired aims.

It is the object to discuss briefly some of the information which may be secured from accounting that will assist in better business relationships.

The publication of financial statements as of a past date has had considerable effect upon the members of the community. Mr. Thomas W. Lamont¹ has pointed out the tremendous influence which financial publicity has had upon the financial standing of railroads and certain other public utility corporations, the national banks and certain other financial institutions, and such industrial corporations as the United States Steel Corporation, the General Motors Corporation, and concerns whose securities are listed upon the stock exchanges. Such publicity has its effect and tends toward a better understanding of business. Financial statements as instruments for the securing of significant information about an enterprise are subject to definite and often serious limitations. The manner in which they are usually presented, for the use of stockholders and prospective investors, limits their usefulness still further.

From the social point of view, the community looks upon the business enterprise as an institution which furnishes desirable services. The efficiency of the business in carrying out its purposes should be judged only incidentally by the profits which it secures. The public is interested in getting more and better goods for its money. Unless the enterprise avails itself of legitimate opportunities to lower its costs and prices by improving its facilities and technique, it does not deserve to serve the public. That which the public wishes to see reflected, in the accounting of the concern to it, is the progress made in the increasing of services or the provision of desirable services at better and better advantages in purchasing power. The public expects these services at prices which will yield profits commensurate with the risk assumed and the forethought exercised.² If business enterprises do not present pertinent accounting data to the public through proper publicity methods, they should not be surprised to find themselves being dealt with harshly.

From a social viewpoint, the employee looks upon the business enterprise as an institution for the rendering of social service in which he has a part. He judges the business enterprise by its ability and willingness to furnish him with increased purchasing power and increased betterments in working conditions. Organized labor has recognized

¹ *Industrial Management*, July, 1927.

² See Chapter X.

that labor must cooperate to produce more goods per employee if progress is to be made in social well being. The compensation for greater and greater production must be increased purchasing power. Labor expects to share this increased productivity with the business enterprise and the public. Accounting data may be used to furnish the employee with information as to the probable share he has received, and may receive, in larger production. Such data may be made available for individuals, collectively or singly. It is incumbent upon the enterprise to make the data available and to give the data adequate publicity. Unless the proper data are made available, the employee may look at the general balance sheet and profit and loss statement and have grave misgivings as to the share retained by the business enterprise. He may look at an appraisal of the wastes in his industry, and conclude that he has not received his just share in what he has actually produced. Unless the managers and the administrators provide the employee with an accounting for benefits which he has received for that which he has produced, they should not complain because labor makes "unreasonable" demands for more purchasing power.

The stockholder who realizes the broader aspects of the business enterprise realizes that it is a social machine and exists by virtue of its service to mankind. An adequate return is necessary to encourage savings. Assurance of this return, the stockholder feels, is a condition precedent to continued savings and investment in the business enterprise. Such a stockholder judges the business enterprise not entirely by the purchasing power which he secures or which accrues to him and by the protection of his investment, but he is also interested in the questions in which the community is interested. Then, too, he looks as far as he can to the future. The customary financial statements which he receives do not provide the necessary information, in many cases, for him to determine whether the profits are as much as may reasonably be expected or whether the administrators have assayed the performance of management and found it to be in agreement with reasonable standards for performance. The ways and means of accounting, however, may be used to convey vital and significant information to stockholders, bondholders, and general creditors. Many of these ways and means are set forth herein.

In its broader aspects, accounting may be used to show the public, the employee, the administrators, the managers, the stockholders, and the general creditors of a concern the advantages which each has and may receive from the provision of services to mankind. Internal data

of the business enterprise provide much of the desired information. External data, or data outside the particular concern, or the industry, may be used to place the internal data in their proper perspective. Nothing in business is so destructive as ignorance of vital and significant information regarding business. One of the most potent forces that tends toward good will and understanding in the community is properly appraised information widely disseminated.

General Purposes of Illustration.—In order to make more concrete some of the concepts of accounting, as set forth in this treatise, it was thought that a fairly comprehensive illustration should be given to emphasize some of its features. The reader usually manifests more enthusiasm over an illustration covering the actual operations of a given enterprise than he does over a hypothetical illustration. No concern has been found, however, which could serve the purposes that this illustration seemed to demand. Then, too, any enterprise selected would object to having much of the information required for illustrative purposes exposed to the general public. To serve the purposes of this treatise, the illustration had to be fairly simple and at the same time a business which was large enough to secure many of the advantages of an organization, such as is indicated herein.

Selecting the Illustration.—An illustration could have been formulated which covered the operations of a business engaged in any extensive line of activity. Studies were made of three industries and from these studies it was decided that, for the purposes of this treatise, a concern engaged in the manufacture and sale of automobile tires and tubes would be the most easily understood. Having selected the industry, further researches were made to cover pertinent information about the tire and tube business and related businesses.

The operations of three large concerns in the rubber industry were studied. The concern which is designated in this illustration as the "Mileage Tire Company" is the result of a combination of the operations of these three concerns and other information obtained in the industry. Due allowance must be made, however, for the development of concepts and of statements uncommon to any that were observed in the industry.

The Business.—The operations of the Mileage Tire Company, as reflected in the statements presented herein, are similar to some of the large tire and tube manufacturers, so that, while the Mileage Tire Company is a "hypothetical" company, yet the data used conform to

that which might be found in any of the sizable concerns in the industry.

The Balance Sheet Items.—The general classification of balance sheet items used in this illustration has been taken from the classification of accounts recommended by the Rubber Association of America, Inc. The items which appear in the balance sheets were secured by means of balance sheet ratios. Briefly, these ratios were secured by combining the balance sheets of certain prominent corporations, then adjusting the combined balance sheets to allow for the investment used in other than the tire and tube business. A ratio for each item in the balance sheet was computed as of January 1, 1926. A ratio of dollar investment to standard capacity to produce one thousand units of product was then computed. This ratio was multiplied by the capacity set for the Mileage Tire Company. This gave the total assets that would be employed in the business. The balance sheet ratios were then multiplied by the total assets to secure the various balance sheet items at January 1, 1926. Each quarterly balance sheet after that date is drawn to reflect the conditions of the business at the date of the balance sheet. Ratios were used for this purpose.

Profit and Loss Items.—The profit and loss items were secured from two different kinds of computations. The first class of computations was used to determine the standard operating profit. This was secured by the multiplication of units by prices and extending the several products into the profit and loss statement. The prices were secured from individual enterprises and from other sources. The second class of computations was secured by the multiplication of representative ratios by the sales. These calculations were made for all items other than those entering into the standard operating profit.

The Profits Policy.—A definite profits policy for a business is necessary at the outset, if best results are to be secured. A profits policy should be determined only after adequate research and study; but before this research can be completed, due weight must be given to the general idea of the board of directors as to an adequate return. A high profits policy may have a tendency to increase competition, but this general tendency may have no effect upon individual enterprises, due to the efficiency of one concern over others. A net return, over a period of years, of a specified amount should be striven for, but the profits earned in a specific year may vary widely from this average.

The directors of the Mileage Tire Company, after considering the staff reports, felt that for the year 1926, the preferred stock should

earn its 7% dividend and that the common stock and the surplus should earn $12\frac{1}{2}\%$ on the book value thereof. There is \$25,504,000 in 7% cumulative preferred stock outstanding. This requires an annual payment of \$1,785,280. The common stock and surplus amount to \$54,496,000 and the earnings on this should be, at $12\frac{1}{2}\%$, \$6,812,000. The common stockholders have been paid 2% quarterly for several years and it is desired to maintain these dividends. These dividends will amount to \$2,400,000 (8% of \$30,000,000). After making the payment for common stock dividends, a balance of \$4,412,000 should remain to provide for reserves and the expansion of the business. The establishment of a profits policy should be the first step taken in making the budget plan for a business.

The Budget.—Something should be said of the procedure used to arrive at the budgets for 1926. The methods used to secure balance sheets and profit and loss statements for the Mileage Tire Company were indicated above. The data used in the budget had to be developed. The procedure was to take the experiences of existing enterprises, for the most part, and apply them to the case. This may appear as an arbitrary method of securing a "forecast." It is not, however, as arbitrary as it may appear, since the forecasts vary no more than particular firms have secured at one time or another. It should be understood clearly that while the data used in the statements of the Mileage Tire Company are secured from businesses and averages of certain businesses in the industry, their objective is to serve as illustrative material.

CHAPTER XXIV

INTERNAL STATISTICAL STUDY

Sharing the Total Tire Business.—Under competitive conditions, each competitor secures a share of the total business. If an individual concern is to know whether or not it is securing its “share” of business to be had, some study must be made of the portion of the business it has secured in the past and the probable increase of its business during a specified period. One of the easiest ways of telling whether or not the business is progressing satisfactorily as to volume is to see that it secures its share of the total business to be had.

It is not always practicable to make a comprehensive study of the volume of business done, but such a study should be of material assistance in the management of the business. In Table 27 are given

TABLE 27
AUTOMOBILE TIRE SHIPMENTS

<i>Years</i>	<i>Total</i>	<i>Mileage</i>	<i>% of Business</i>
1921	23,271	4,825.0	20.73
1922	29,990	6,104.6	20.35
1923	33,893	7,054.2	20.81
1924	38,005	7,927.4	20.86
1925	44,524	9,292.9	20.88
1926	44,250	9,403.9	21.25
1927	50,000*	10,426.8*	20.85

*Estimated.

Unit: Thousands.

the statistics on automobile casings sold by the Mileage Tire Company in comparison to the statistics published by the Rubber Association of America. During the years 1921–1926, inclusive, the company did from 20 to 21 per cent of the business. The statistics of the Mileage Tire Company are included in those used herein.

The Study of Shipments by Classes.—The total shipments furnish a basis for further analysis to determine the percentage of business that is secured from the several products sold. In Table 28 is shown the shipments of tires, by lines of tires, together with the percentage of business done in each line. These statistics are taken from

TABLE 28

TOTAL SHIPMENTS OF TIRES, BY CLASSES AND PERCENTAGES

<i>Years</i>	<i>Quar- ters</i>	<i>Total</i>	<i>Cord Tires</i>	<i>Fabric Tires</i>	<i>Balloon Tires</i>	<i>% Cord</i>	<i>% Fabric</i>	<i>% Balloon</i>
1924.....	1st.	8,696	5,406	3,149	141	62.16	36.21	1.63
	2nd.	8,537	5,170	2,532	835	60.55	29.65	9.80
	3rd.	11,158	6,771	3,160	1,227	60.68	28.32	11.00
	4th.	9,614	5,594	2,672	1,348	58.18	27.79	14.03
		38,005	22,941	11,513	3,551	60.36	30.29	9.35
1925.....	1st.	9,523	4,784	2,243	2,496	50.23	23.55	16.22
	2nd.	13,642	6,889	2,246	4,507	50.49	16.46	33.05
	3rd.	11,720	6,305	1,755	3,660	53.79	13.99	32.22
	4th.	9,639	4,707	967	3,965	48.83	10.04	41.13
		44,524	22,685	7,211	14,628	50.95	16.20	32.85
1926.....	1st.	8,227	3,759	506	3,962	45.69	6.15	48.16
	2nd.	11,936	5,607	691	5,638	46.97	5.80	47.23
	3rd.	14,341	7,173	873	6,295	50.01	6.10	43.89
	4th.	9,746	4,820	447	4,479	49.45	4.60	45.95
		44,250	21,359	2,517	20,374	48.26	5.70	46.04

Source: Rubber Association of America.

Unit: Thousands of tires.

those published by the Rubber Association of America, Inc., and cover approximately 80 per cent of the industry.

The shipments of the Mileage Tire Company from 1921 to 1926, inclusive, are shown in Table 29. A study of this table will show the results of the changes in the types of tires consumed. The sales of fabric casings declined so materially that the Mileage Tire Company completely eliminated the item from their 1927 program. The esti-

TABLE 29

ANALYSIS OF CLASSES OF TIRE SHIPMENT—MILEAGE TIRE COMPANY

<i>Years</i>	<i>Total</i>	<i>Cord Tires</i>	<i>%</i>	<i>Fabric Tires</i>	<i>%</i>	<i>Balloon Tires</i>	<i>%</i>
1921....	4,825.0	1,379.9	28.60	3,445.1	71.40	—	—
1922....	6,104.6	2,892.4	47.38	3,212.2	52.62	—	—
1923....	7,054.2	3,976.5	56.37	3,077.7	43.63	—	—
1924....	7,927.4	4,926.9	62.15	2,199.9	27.75	800.6	10.10
1925....	9,292.9	4,516.4	48.60	1,537.9	16.55	3,238.6	34.85
1926....	9,403.9	4,532.7	48.20	352.6	3.75	4,518.6	48.05
1927*....	10,426.8	4,692.1	45.00	—	—	5,734.7	55.00

*Estimated.

Unit: Thousands of tubes.

mated sales for 1927 places balloon tire shipments at 55 per cent of the total, while cord tires will probably be about 45 per cent of the total business. The sales of balloon tires have increased to such an extent that this tire promises to displace cord tires as the cord tire displaced the fabric tire.

Ratio of Tube to Tire Consumption.—Since tires and tubes do not have the same life, it becomes necessary to study the ratio of the consumption of tubes to tires before production is planned or productive capacity is provided. The ratios of tube to tire shipments of the Mileage Tire Company is shown in Table 30. This table discloses that there are seasonal variations in the ratio of tube to tire consumption

TABLE 30
RATIO OF TUBE TO TIRE SHIPMENTS—MILEAGE TIRE COMPANY

Year	Quarter	Cord and Fabric Tires	High Pressure Tubes	Ratio: Tubes Tires	Balloon Tires	Balloon Tubes	Ratio: Tubes Tires
1924	1st.....	1,658.7	2,332.8	1.4064	31.2	17.0	—
	2nd.....	1,626.3	2,317.8	1.4252	192.9	146.7	—
	3rd.....	2,119.5	3,013.7	1.4219	281.5	239.2	—
	4th.....	1,722.3	2,347.9	1.3632	295.0	277.6	—
		7,126.8	10,012.2	1.4202	800.6	680.5	.8499
1925	1st.....	1,390.3	2,215.3	1.5934	555.4	556.7	1.0023
	2nd.....	1,972.2	2,579.8	1.3080	1,004.0	1,063.4	1.0592
	3rd.....	1,663.2	2,572.4	1.6548	842.3	830.0	.9853
	4th.....	1,028.6	2,042.7	1.9859	836.9	883.5	1.0556
		6,054.3	9,590.2	1.5840	3,238.6	3,333.6	1.0293
1926	1st.....	863.0	1,381.2	1.6000	903.7	962.7	1.0653
	2nd.....	1,310.3	1,625.0	1.2402	1,269.7	1,369.9	1.0789
	3rd.....	1,630.3	2,210.1	1.3556	1,400.8	1,427.3	1.0189
	4th.....	1,081.7	1,669.1	1.5430	944.4	1,029.8	1.0904
		4,885.3	6,885.4	1.4094	4,518.6	4,789.7	1.0600
1927*	Jan.....	284.8*	445.2*	1.5632	245.4*	283.9*	1.1568
	Feb.....	294.2*	374.3*	1.2722	347.0*	331.0*	.9539
	Mar.....	348.2*	477.6*	1.3716	490.9*	536.0*	1.0918
		927.2*	1,297.1*	1.3989	1,083.3*	1,150.9*	1.0624
Year*.....		4,692.1*	6,333.4*	1.3500	5,734.7*	6,365.5*	1.1000

*Estimated.

Unit: Thousands

Prior to the introduction of balloon tires and tubes, the sales of tubes exceeded the sale of tires from 40 per cent to 60 per cent. Little experience was available to show the ratio of tube to tire consumption in this new line. The temptation was to plan production facilities upon somewhat the same basis as past experience would indicate. This led to a temporary excess capacity for balloon tubes, which may be surmised from Table 37. It was found that it took about a year for the sale of balloon tubes to equal the sale of balloon tires, and that there

TABLE 31

RATIO OF TUBE TO TIRE CONSUMPTION—GENERAL AVERAGE IN THE UNITED STATES

<i>Years</i>	<i>Quarter</i>	<i>Cord and Fabric Casings</i>	<i>High Pressure Tubes</i>	<i>Ratio: Tubes Casings</i>	<i>Balloon Casings</i>	<i>Balloon Tubes</i>	<i>Ratio: Tubes Casings</i>
1924	1st.....	8,555	10,353	1.2101	141	88	.6242
	2nd.....	7,702	10,569	1.3722	835	630	.7544
	3rd.....	9,931	15,158	1.5263	1,227	1,035	.8435
	4th.....	8,266	11,940	1.4445	1,348	1,239	.9191
		34,454	48,020	1.3937	3,551	2,992	.8425
1925	1st.....	7,027	9,755	1.3882	2,496	2,441	.9779
	2nd.....	9,135	13,242	1.4495	4,507	4,589	1.0181
	3rd.....	8,060	13,260	1.6451	3,660	3,785	1.0341
	4th.....	5,674	9,629	1.6971	3,965	4,052	1.0219
		29,896	45,886	1.5348	14,628	14,867	1.0163
1926	1st.....	4,265	5,212	1.2220	3,962	4,122	1.0403
	2nd.....	6,298	7,533	1.1961	5,638	6,156	1.0918
	3rd.....	8,046	12,867	1.5992	6,295	6,577	1.0447
	4th.....	5,267	6,714	1.2749	4,479	4,523	1.0098
		23,876	32,326	1.3539	20,374	21,378	1.0492

Unit: Thousands.

was a decided tendency for the consumption in this line to remain about 30 per cent below the recent experience with the high pressure tires.

The ratios of tube to tire consumption in the United States are shown in Table 31. A comparison of the data shown in Tables 30 and 31 shows the competitive conditions of the Mileage Tire Company. Each year the statistics of the company show higher percentages than the average. The products of the company are known to give better use in service than the majority of tires and tubes. In the light of these facts, it seems evident that the company is progressing satisfactorily as regards the proportion of business secured.

The Unit as a Criterion.—Every business needs some criterion by which it can judge its relative position in the industry. To make the comparison on the comparative amount of capitalization is a crude and ineffective method. A comparison of profits meets with the same objection. Of the many criteria, the most effective seems to be the unit basis. If statistics can be obtained which will show the approximate consumption of a given article and a manufacturer knows the relation of his output to the total output, he is in a position to know the place of his business in the industry.

The Mileage Tire Company, for example, sold about 21 per cent of the cord tires in the United States during 1926, and from the statistics presented in Table 32, it appears that the company is maintaining

TABLE 32

SHARING THE TIRE BUSINESS WITH COMPETITORS						
Years	Total	<u>Cord Tire Shipments</u>		Total	<u>Balloon Tire Shipments</u>	
		Mileage	Per cent		Mileage	Per cent
1924.....	22,941	4,926.9	21.48	3,551	800.6	22.55
1925.....	22,685	4,516.4	19.91	14,628	3,238.6	22.14
1926.....	21,359	4,532.7	21.22	20,374	4,518.6	22.17
1927.....	—	4,692.1*	—	—	5,734.7*	—

Source: Rubber Association of America.

Unit: Thousands of tires.

*Estimated.

its share of the tire business. The share of business which a firm secures depends upon a number of factors, some of the most important of which are as follows: the profits policy, the price policy, the quality of product offered, the sales effort, and other factors. The board of directors which adopts a policy of maintaining its share of the business in units and increasing gradually its share of the total business has adopted an exceedingly wise policy. Its profits policy should give due consideration to this policy.

Sharing the Total Tube Business.—The management of the Mileage Tire Company wishes to know if the company is securing its share of the tube business. Table 33 supplies some of the facts in the case. The ratio of balloon tube to balloon tire shipments for 1926 was 1.0600 for the Mileage Tire Company (Table 30) and 1.0492 for the average (Table 31). The per cent of the company's business in balloon tires to the total was 22.17 (Table 32), while the same ratio for balloon tubes was 22.50. If it be assumed that the last-mentioned set of data (22.50–22.17) are comparable directly, then the shipment of balloon tubes compared to balloon tires is favorable. If it

TABLE 33

THE PERCENTAGE OF THE TUBE BUSINESS DONE BY THE MILEAGE TIRE COMPANY

Years	<i>Shipments High Pressure Tubes</i>			<i>Shipments Balloon Tubes</i>		
	<i>Total</i>	<i>Mileage</i>	<i>Per Cent</i>	<i>Total</i>	<i>Mileage</i>	<i>Per Cent</i>
1921.....	27,796	5,795.5	20.85			
1922.....	37,225	7,631.1	20.50			
1923.....	44,304	9,259.5	20.90			
1924.....	48,020	10,012.2	20.85	2,992	680.5	22.74
1925.....	45,886	9,590.2	20.90	14,867	3,333.6	22.42
1926.....	32,326	6,885.4	21.30	21,286	4,789.7	22.50
1927.....		6,333.4			6,365.5	

*Estimated.

Unit: Thousands of tires.

be assumed, however, that the company should maintain its ratio above the average, then the following computations should be made: 1.0600 minus 1.0492 equals .0108. And 22.17 times 1.0108 equals 22.41, which, when compared with 22.50, shows that the shipments of tubes compare favorably with shipments of balloon tires.

Based upon the assumption that the company should maintain its ratio of shipments of tubes to tires over the average, the following values are ascertained:

Years	<i>High Pressure Tubes</i>		<i>Balloon Tubes</i>	
	<i>Percentage of Business</i>	<i>Computed Per Cent</i>	<i>Percentage of Business</i>	<i>Computed Per Cent</i>
1924.....	20.85	22.05	22.74	22.71
1925.....	20.90	20.89	22.42	22.43
1926.....	21.30	22.19	22.50	22.41

Where the computed per cent is less than the percentage of business, this indicates that the comparison given here is favorable.

A direct comparison of Tables 32 and 33 indicates that during the years 1924-1926, inclusive, high pressure tube shipments compared favorably with the shipments of cord tires. This type of comparison indicates that the company secures certain portions of the total business in each line; and except for 1924 high-pressure tube shipments, the comparison is favorable.

The management should decide which of the above bases of comparison is to be used in setting the goal and in judging the effectiveness of the concern in carrying out its policies.

Seasonal Variations in Shipments.—The tire and tube business is affected by the seasons of the year—that is, sales are not uniform throughout the year. In planning the operations of a business, these seasonal variations must be known, if the best advantages of the

conditions which the business faces are to be taken. The raw data in the tire and tube business, which must be used in the construction of seasonal variations, are subject to fluctuations which are in reality not true. One of the chief factors which has entered into the present data is the practice of giving "advanced datings" on shipments. This means that the goods are shipped, but the bills may be dated months

TABLE 34
SEASONAL VARIATIONS IN SHIPMENTS OF THE MILEAGE TIRE COMPANY

<i>Months</i>	<i>Cord Tires</i>	<i>High Pressure Tubes</i>	<i>Balloon Tires</i>	<i>Balloon Tubes</i>
January.....	6.07	7.03	4.28	4.46
February.....	6.27	5.91	6.05	5.20
March.....	7.42	7.54	8.56	8.42
	<hr/> 19.76	<hr/> 20.48	<hr/> 18.89	<hr/> 18.08
April.....	7.86	7.29	9.82	10.15
May.....	8.71	8.29	9.82	10.15
June.....	9.36	9.43	10.33	10.15
	<hr/> 25.93	<hr/> 25.01	<hr/> 29.97	<hr/> 30.45
July.....	9.71	11.05	10.08	9.65
August.....	10.65	10.17	8.82	8.91
September.....	9.51	8.92	8.56	8.42
	<hr/> 29.87	<hr/> 30.14	<hr/> 27.46	<hr/> 26.98
October.....	8.21	8.29	9.57	9.16
November.....	7.62	8.04	7.81	7.66
December.....	8.61	8.04	6.30	7.67
	<hr/> 24.44	<hr/> 24.37	<hr/> 23.68	<hr/> 24.49
	<hr/> 100.00	<hr/> 100.00	<hr/> 100.00	<hr/> 100.00

hence. Since published statistics contain "shipments" instead of present-day sales, care must be used to give effect to such defects in the data, where practicable, if a comparison is to be made between the seasonal variations within the industry compared to those of a given business.

The seasonal variations in shipments of the Mileage Tire Company are shown in Table 34. The index for the seasonal variations in cord tires and high pressure tubes is found by the following method: the shipments of tires for each month are divided by the total shipments of tires for the corresponding year. The same procedure is

followed for tubes. A frequency distribution sheet is used to determine the similarity of the variations in the percentages for each month of the year for tires and for tubes. The average for each monthly index is constructed from an average of the values of four out of six cases. The high and the low values for each month were eliminated

TABLE 35
SEASONAL VARIATIONS IN PRODUCTION OF THE MILEAGE TIRE COMPANY

<i>Months</i>	<i>Cord Tires</i>	<i>High Pressure Tubes</i>	<i>Balloon Tires</i>	<i>Balloon Tubes</i>
January.....	8.13	7.45	7.20	7.69
February.....	8.13	7.87	6.70	6.45
March.....	9.05	9.99	6.95	6.45
	25.31	25.31	20.85	20.59
April.....	8.80	8.63	8.63	8.18
May.....	8.94	8.30	9.19	8.93
June.....	8.04	7.63	10.68	11.17
	25.78	24.56	28.50	28.28
July.....	8.55	8.13	10.43	10.18
August.....	8.99	8.97	9.68	9.18
September....	8.30	8.97	7.20	7.94
	25.84	26.07	27.31	27.30
October.....	7.89	8.63	6.95	7.94
November.....	7.46	8.47	7.20	8.45
December.....	7.72	6.96	9.19	7.44
	23.07	24.06	23.34	23.83
	100.00	100.00	100.00	100.00

The index so found was then raised to one hundred by appropriate statistical methods.

The balloon tire and tube index was constructed in a similar manner to the index of seasonal variations for cord tires and high pressure tubes, except that experience was available for only three years. An average was obtained from the values of the two cases most similar in each month. This index was then raised to one hundred by appropriate methods.

This index of seasonal variations was used to apportion the total forecast shipments of the Mileage Tire Company to the several

months and quarters. For example, the estimated sales of balloon tires for 1927 is 5,734,700, the seasonal index for the first quarter is 18.89 and the product is 1,083,284 or 1,083.3, as shown in Table 30. The monthly forecast of sales units in each product is ascertained by the same method.

Seasonal Variations in Production.—In a manufacturing business lower costs should be obtained where the output is constant than where the output fluctuates materially. For this and other reasons, good management endeavors to keep production at as steady a level as the finances of the business permit and business conditions warrant. The index of seasonal variations in production of the Mileage Tire Company is shown in Table 35. This index is constructed from the production records of cord tires and high pressure tubes of the past three years, and from the records of the past two years in the case of balloon tires and tubes. This index is constructed by the usual procedure for constructing such indices, as indicated above in the construction of an index for seasonal variations in shipments.

It will be observed that while the quarterly seasonal variations in production are relatively stable in each of the two groups of products, yet their monthly indices have significant variations. Thus, the cord tire and high pressure tube group have the same quarterly index of 25.31 for the first quarter while in March the variation is about 11 per cent.

The index of seasonal variations was used to distribute the production for 1927 to the various months and quarters. For example, the estimated shipments of balloon tires for 1927 is 5,734,700, the seasonal index for the first quarter of production is 20.85, so that the production schedule will call for fabrication of 1,195,685 balloon tires during the first quarter of 1927. The index is used in a similar manner to determine monthly production.

Some Experience Data.—The shipments, production, and inventory experience for the Mileage Tire Company for cord tires, high pressure tubes, balloon tires, and balloon tubes are shown in Tables 36a, 36b, and 37. These data are on a monthly basis. The shipment data of the Mileage Tire Company correspond relatively close to the data published by the Rubber Association of America, Inc. The production of the Mileage Tire Company has been less seasonal in the past than the general average production. The indices of seasonal variations have been prepared from the percentages which appear in the accompanying tables.

TABLE 36A

MILEAGE TIRE COMPANY CORD TIRE AND HIGH PRESSURE TUBE EXPERIENCE 1921-1923

	Cord Tires					High Pressure Tubes				
	Shipments		Production		Inven- tory	Shipments		Production		Inven- tory
	Units	%	Units	%	Units	Units	%	Units	%	Units
1921										
Jan.....	63 6	4 61	72 6	5.50	191 1	231 8	4 00	267 0	4.60	429 2
Feb.....	69 4	5 03	80 5	6 10	202 2	240 5	4 15	284 4	4 90	473 1
Mar.....	97 3	7 05	92 4	7 00	197 3	373 8	6 45	371 6	6 40	470.9
Apr.....	100 7	7 30	97 0	7.50	195 6	423 1	7.30	400 6	6 90	448 4
May.....	135.2	9 80	100 3	7.60	160 7	498 4	8 60	415 1	7 15	365 1
June.....	144 9	10 50	113 6	8 60	129.4	649 1	11.20	449 9	7 75	165.9
July.....	152 5	11 05	127 3	9 65	104.2	753 4	13.00	748 8	10 90	161.3
Aug.....	162.8	11.80	136 0	10 30	77 4	799 8	13 80	746 0	12.85	107 5
Sept.....	138.7	10 05	131 4	9 95	70 1	504 2	8 70	592 1	10.20	195 5
Oct.....	104.9	7 60	126 7	9 60	91 9	428 9	7 40	589 2	10 15	355.7
Nov.....	92 5	6 70	124 0	9 40	123 4	430 3	5 70	525 9	9 06	451 3
Dec.....	117 4	8.51	110 3	9 80	122 3	462.2	9 70	414 5	7.14	404 6
Total.....	1379 9	100 00	1320 1	...	...	5795 5	.....	5805.1	...	...
1922										
Jan.....	141 7	4.90	203 8	7.10	184 4	389.2	5 10	400 5	5.20	415 9
Feb.....	144 1	4 98	172 2	6 00	212.5	366 3	4 80	485 2	6 30	534.8
Mar.....	196 7	6 80	157 9	5 50	173 7	473 1	6 20	635.3	8.25	697 0
Apr.....	203 9	7 05	189 4	6 60	159.2	496 0	6 50	608 4	7.90	809.4
May.....	238 6	8 25	208 1	7 25	128 7	602 9	7 90	554 4	7.20	760.9
June.....	283 5	9 80	285 6	9 95	130 8	839.4	11 00	670 0	8.70	591 5
July.....	260 3	9 00	286 4	9 98	156.9	774 6	10 15	662.3	8.60	479.2
Aug.....	321 1	11 10	285 0	9 93	120.8	854 7	11.20	689 3	8.95	313 8
Sept.....	266 1	9 20	235 1	8 19	89.8	671.5	8.80	646.9	8.40	289 2
Oct.....	274 8	9 50	284.1	9 90	99.1	702.1	9.20	827 9	10.75	415.0
Nov.....	258 8	8 95	283 6	9 88	123 9	690 6	9 05	839 4	10.90	563.8
Dec.....	302 8	10.47	279.0	9.72	100.1	770 7	10 50	681.6	8.85	474.7
Total.....	2892.4	100 00	2870.2	100 00	...	7631 1	100.00	7701 2	100.00	.....
1923										
Jan.....	330 1	8 30	321.2	8.05	91 2	805 6	8 70	831 5	8.95	500.6
Feb.....	310 2	7 80	327.2	8 20	108.2	666.7	7 20	873 3	9 40	707 2
Mar.....	397 6	10 00	373 1	9.35	83 7	847.2	9 15	859.3	9 25	719 3
Apr.....	358 8	9.70	361.1	9.10	61.0	759 3	8 20	854 7	9.20	814 7
May.....	348 0	8.75	359.1	9 00	72.1	740.8	8.00	826 8	8 90	900.7
June.....	290.1	7 30	351.2	8 80	133 2	824.0	8.90	840.8	9.05	917.5
July.....	274.4	6.90	315.2	7 90	174 0	833 4	9 00	817 5	8 80	901 6
Aug.....	322.0	8.10	299 3	7.50	151 3	888 9	9 60	724 7	7 80	737 1
Sept.....	310.2	7.80	331.2	8.30	172.3	722 2	7 80	518.4	5.58	533 0
Oct.....	334 0	8.40	318 4	7.98	156.7	700.7	8 00	603.9	6.50	396 8
Nov.....	330.1	8 30	311.2	7.80	137 8	722 2	7 80	733 9	7.90	408 5
Dec.....	344.0	8.65	320 0	8 02	113.8	708.5	7.65	805.5	8 67	505 5
Total.....	3976.5	100 00	3990.2	100.00	...	9259.5	100 00	9290.3	100.00	.....

TABLE 36B

MILEAGE TIRE COMPANY CORD TIRE AND HIGH PRESSURE TUBE EXPERIENCE

1924-1926

	Cord Tires					High Pressure Tubes				
	Shipments		Production		Inven- tory	Shipments		Production		Inven- tory
	Units	%	Units	%	Units	Units	%	Units	%	Units
1924										
Jan.....	374 4	7 60	402 6	8 05	142 0	790 9	7 90	810.1	8.10	524.7
Feb.....	404 0	8 20	405.1	8 10	143.1	750 9	7 50	800 2	8.00	574 0
Mar.....	394.2	8.00	487 7	9.75	236 6	791 0	7.90	900 2	9 00	683.2
Apr.....	399 1	8 10	453 2	9.06	290 7	755 9	7 55	820 1	8.20	747 4
May.....	352.3	7.15	445.1	8.90	383.5	710.9	7.10	815 1	8.15	851.6
June.....	359.6	7.30	387.1	7.74	411 0	851 0	8.50	845 2	8 45	845.8
July.....	468 1	9 50	415.1	8 30	358 0	1021.2	10 20	812 1	8.12	636.7
Aug.....	537 0	10 90	430.2	8 60	251.2	1041.3	10 40	830 2	8.30	425.6
Sept.....	423 7	8.60	410 2	8.20	237 7	951.2	9 50	948.2	9 48	422.6
Oct.....	374 4	7 60	405.2	8 10	268 5	911 1	9 10	860 2	8 60	371.7
Nov.....	426 2	8 65	390 1	7 80	232.4	891 1	8 90	830 1	8.30	310.7
Dec.....	413 9	8.40	370.1	7.40	188 6	545 7	5 45	730 1	7 30	495 1
Total.....	4920 9	100 00	5001.7	100.00	..	10,012.2	100 00	10,001.8	100 00	.....
1925										
Jan.....	325 2	7 20	373.8	8 10	237 2	776 8	8 10	647 3	6.90	365.6
Feb.....	293 6	6.50	376.2	8 15	319.8	576 4	6 00	778 6	8.30	567.8
Mar.....	343 2	7 60	440 7	9.55	417.3	863 1	9 00	994.3	10 60	700 0
Apr.....	404.2	8 95	417.7	9.05	430 8	767 2	8.00	834.9	8 90	767 7
May.....	453 9	10 05	415 4	9 00	392 3	930 3	9.70	769 2	8 20	606 6
June.....	523 9	11.60	376.1	8 15	244.5	882 3	9.20	736 4	7 85	460.7
July.....	492 3	10.90	371 5	8 05	123 7	1064.5	11 10	741 1	7 90	137.3
Aug.....	404 2	8.95	372.9	8 08	92 4	939.8	9 80	842.8	8 98	41.9
Sept.....	368.1	8.15	414.0	8 97	138.3	748 1	7 80	911.7	9 72	205 5
Oct.....	420 0	9.30	350.8	7.60	69 1	781 6	8.15	853 6	9.10	277.5
Nov.....	262 0	5.80	327.7	7.10	134.8	671 3	7 00	778.6	8.30	384 8
Dec.....	225 8	5 00	378 5	8.20	287.5	589.8	6 15	492 5	5.25	285.5
Total.....	4516.4	100.00	4615 3	100.00	.....	9590.2	.....	9380.6	.....	.....
1926										
Jan.....	222 1	4 90	364.4	8.06	429.8	468 2	6 80	495.0	7 10	312.3
Feb.....	258.4	5 70	367.1	8 12	358.5	413 1	6.00	578 7	8.30	477.9
Mar.....	326 3	7 20	403 2	8 92	651.4	499.9	7 26	732.1	10.50	710.1
April.....	340.0	7.50	370.7	8.20	646 1	423.5	6 15	627 5	9.00	914.1
May.....	394 3	8 70	373.0	8 25	624.8	616.2	8 95	564 7	8.10	862 6
June.....	453.7	10 01	422 6	9 35	593.7	585 3	8 50	470 6	6 75	747.9
July.....	512.2	11 30	415 9	9 20	497 4	833.1	12.10	564.8	8 10	479.6
Aug.....	548 5	12 10	409.1	9 05	358.0	702.3	10.20	690.2	9 90	467 5
Sept.....	471 4	10 40	352.6	7 80	239 2	674.7	9.80	549.4	8.88	342 2
Oct.....	340.0	7.50	357 1	7 90	256 3	516.4	7 50	557.8	8 05	383.6
Nov.....	298.7	6.59	339 1	7.50	296.7	605 9	8.80	571.7	8 20	349 4
Dec.....	367.1	8.10	345.9	7 65	275 5	546 8	7.94	659 6	8 17	372 2
Total.....	4532 7	100.00	4520 7	100 00	.....	6885.4	.....	6972 1	.....	.....

TABLE 37

MILEAGE TIRE COMPANY BALLOON TIRE AND TUBE EXPERIENCE

	Balloon Tires					Balloon Tubes				
	Shipments		Production		Inven- tory	Shipments		Production		Inven- tory
	Units	%	Units	%	Units	Units	%	Units	%	Units
1924										
Jan.....										18 6
Feb.....					15.2					
Mar.....	31 2	3.90	40 3	4.60	24 3	17 1	2.50	33.7	4.40	35 3
Apr.....	52.8	6.60	59 5	6.80	31 0	41.2	6.05	65 8	8.60	59.9
May.....	63.3	7.90	86.6	9.90	54.3	46 2	6.80	71.2	9.30	84.8
June.....	76 8	9.60	123 5	14.10	101 0	59.2	8.70	97 9	12.80	123.5
July.....	88 1	11.00	105 7	12.08	118 6	68 7	10.10	77 7	10.15	132 5
Aug.....	96 9	12.10	105 3	12.02	127.0	84 4	12.40	84 2	11.00	132.3
Sept.....	96.5	12.05	87.1	9.95	117 6	86 1	12.65	82 3	10.75	128.5
Oct.....	100.9	12.60	86.7	9.90	103.4	91 9	13.50	81 9	10.70	118 6
Nov.....	100 1	12.50	84.0	9.60	87.3	89.1	13.10	78.1	10.20	107 5
Dec.....	94 0	11.75	96.6	11.05	89.9	96.6	14.20	92.5	12.10	103.4
Total.....	800 6	100.00	875 3	100.00	100.00	680.5	100.00	765 3	100.00	.....
1925										
Jan.....	126 3	3.90	239.7	7.05	203 3	123 3	3.70	248 8	7.12	228 9
Feb.....	168 4	5.20	207 4	6.10	242 3	160 0	4.80	213.2	6.10	282.1
Mar.....	260 7	8.05	158 1	4.65	139.7	273.4	8.20	233.5	6.68	242 2
Apr.....	323 2	9.98	275.4	8.10	91 9	336 7	10.10	300 6	8.60	206.1
May.....	330 3	10.20	312 8	9.20	74.4	341.7	10.25	346.0	9.90	210.4
June.....	350.5	10.82	432.2	12.71	156 1	385 0	11.55	370.5	10.60	195.9
July.....	319.0	9.85	411 4	12.10	248.5	333.3	10.00	354 8	10.15	217.4
Aug.....	239.6	7.40	401.2	11.80	410 1	241 7	7.25	323.3	9.25	299.0
Sept.....	283.7	8.76	175 2	5.15	301.6	255 0	7.65	258.6	7.40	302.6
Oct.....	356 2	11.00	238 0	7.00	183 4	338 4	10.15	276 1	7.90	240 3
Nov.....	265 6	8.20	251.6	7.40	169.4	286.7	8.60	284.9	8.15	238.5
Dec.....	215.1	6.64	297.2	8.74	251.5	258.4	7.75	284.9	8.15	265 0
Total.....	3238.6	100.00	3400 2	100.00	100.00	3333 6	100.00	3495.2	100.00	.....
1926										
Jan.....	225.9	5.00	318 1	7.10	343.7	244 3	5.10	396.8	8.10	417.5
Feb.....	280 2	6.20	327 1	7.30	390 6	277 8	5.80	333.1	6.80	472.8
Mar.....	397 6	8.80	408.2	9.11	401.2	440 6	9.20	296.5	6.05	328.7
Apr.....	424.8	9.40	404.1	9.02	380.5	478 9	10.00	382.1	7.80	231.9
May.....	406.7	9.00	403 7	9.01	377.5	481.4	10.05	456.6	9.32	207.1
June.....	438.2	9.70	393 0	8.77	332.3	409.6	8.55	577.1	11.78	374.6
July.....	452 3	10.01	380.9	8.50	260.9	469.4	9.80	494.8	10.10	400 0
Aug.....	474.5	10.50	365.2	8.15	151.6	507.7	10.60	443.4	9.05	335 7
Sept.....	474.0	10.49	405.5	9.05	83.1	450 2	9.40	428.6	8.75	314.1
Oct.....	366.0	8.10	320.4	7.15	37.5	337.7	7.05	394.4	8.05	370 8
Nov.....	325.3	7.20	327.1	7.30	39.3	325 7	6.80	383.1	7.82	428.2
Dec.....	253.1	5.60	427 4	9.54	213.6	366 4	7.65	312.6	6.38	374.4
Total.....	4118.6	100.00	4480.7	100.00	100.00	4789.7	100.00	4899.1	100.00	.....

CHAPTER XXV

RELATING EXTERNAL TO INTERNAL STATISTICS

General Procedure in Forecasting.—The utility of forecasting as an administrative and management tool has not as yet been adequately realized in business enterprises, except in the case of a few concerns. The general idea is to find some indices or business indicators which will serve as forecasting media for a given industry or business. Much has been written about the business cycle. In the study of the business cycle, the fluctuations in business conditions are divided into four classes, as follows:

1. Fluctuations due to the seasonal business.
2. Long-term trend of business.
3. Random fluctuations, and
4. Cyclical fluctuations.

The long-term trend and the seasonal fluctuations may be removed from business data by appropriate statistical methods. This leaves for consideration only the random and the cyclical fluctuations. If a business concern can find some commodity or group of commodities, or some business indicator, which will show cyclical fluctuations which precede those of a given business by, say three to five months, the administration of the business with regard to external business conditions then becomes relatively a simple matter. When the business indicator forecasts a rise in activity, there is sufficient time to take advantage of the opportunities offered. When a decline is forecast, the time to effect liquidation is far enough in advance to insure against large losses. With adequate forecasting means, the operations of a business may be planned and executed without having to curtail operations sharply at one period, and unduly to speed up operations at another period.

Research for a Business Indicator.—Research studies were made to discover a suitable business indicator for the Mileage Tire Company and for the tire industry. The following series of data were studied: 1, the production of (a) coke and anthracite pig iron, and (b) automobile production. 2, (a) the Harvard B series, (b) im-

portation of crude rubber, (c) Standard index of Industrial Production, (d) gasoline consumption, (e) building contract awards in 27 states, and (f) 20 Basic Commodity Price Index. A close study of these series disclosed that tire and tube shipments could not be forecast from a knowledge of the cyclical fluctuations of any of the series studied. The results of these studies were disappointing because some of these series are reputed business indicators.

A Forecasting Medium.—The yearly total registration of automobiles for a series of years was plotted on semi-log paper. The sev-

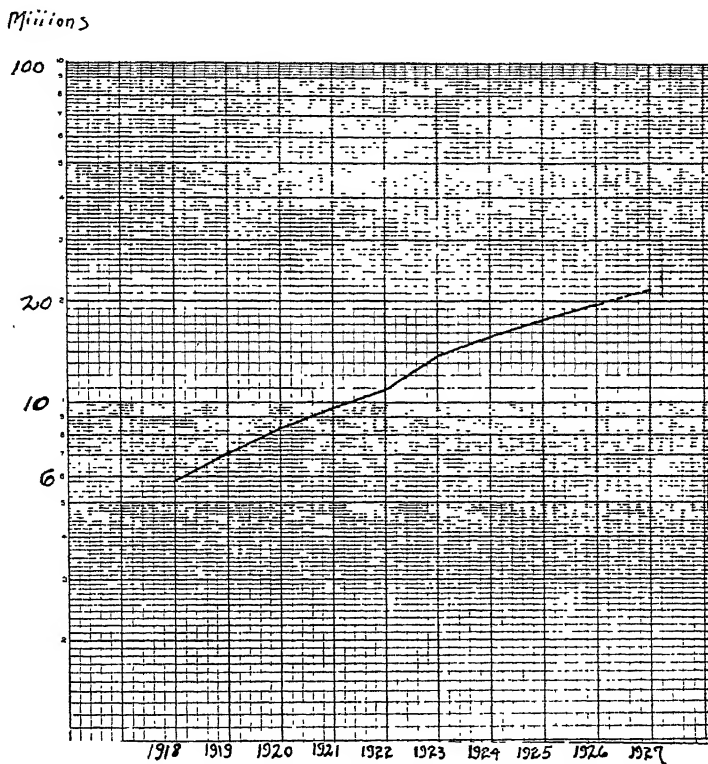


Figure 28. Automobile Registration and Forecast.

eral points were connected by a line which appeared almost straight. Such a line might be extended into the future by statistical methods or by inspection. Such a line would forecast automobile registration with reasonable accuracy. A study was made to ascertain if there were not a fairly definite relationship between automobile registration and tire and tube shipments.

Since the registration of automobiles from year to year appears to increase "in a straight line," it is evident that the business cycle has little effect upon the registration of automobiles. There are prominent writers who advocate that all business travels in cycles. Some industries appear to travel in cycles; but do all of them? From *a-priori* reasoning it appears that people will make their tires and tubes last longer when times are bad than they will when times are good. By the same process of reasoning the conclusion should be reached that people will make their automobiles last longer when times are bad than they will when times are good. Further, they should not renew automobiles as fast as they do tires and tubes be-

TABLE 38

THE FORECAST OF AUTOMOBILE REGISTRATION IN THE UNITED STATES

Equation: $\text{Log. } y = 4.07229 + .031686 x - .00033 x^2$

Years	x	y	Log of Trend	y Computed Trend Value	Percentage Relationship To Actual Trend
1919.....	- 7	7,144	3.86736	7,368	96.9
1920.....	- 5	8,380	3.92281	8,372	100.0
1921.....	- 3	9,483	3.98092	9,571	99.1
1922.....	- 1	10,960	4.04164	11,006	99.5
1923.....	+ 1	13,540	4.10434	12,716	106.4
1924.....	+ 3	15,461	4.18506	15,313	100.9
1925.....	+ 5	17,496	4.22317	16,718	104.6
1926.....	+ 7	19,237	4.27862	19,437	98.9
1927.....	+ 9		4.33138	21,448*	

*Estimated.

Unit: 1000 automobiles.

cause the latter require a much smaller outlay of money. Such reasoning as the above, however, must be tested by how people "do" act and not by how they "should" act for their own best interests.

Forecasting Automobile Registration.—The general procedure for studying statistical data for forecasting purposes is first to plot the data on proper cross-section paper. The solid line in Figure 28 shows the preliminary study of automobile registration. Since these data approximate a straight line on semi-log paper the series follow the geometric law. This line may be extended for a year by approximation. The line of "best fit" would appear to follow, not a straight line, but an exponential curve. For the purposes of the Mileage Tire Company a second degree parabola (logarithmic) is adequate for purposes of forecasting for a year or two. Table 38 shows the equation used in the forecast, the forecast for 1927, and the per-

centage relationship of the line of trend to the actual trend. The method used in making the computations may be secured from standard books on statistics and is omitted here. The forecast of 21,448,000 automobile registrations may be a little optimistic because the curve indicates a relatively steady percentage in registration for the past several years, and the experience with such data is that there is a tendency toward a gradual decline in the slope of the curve as the "saturation point" is reached.¹

TABLE 39
AUTOMOBILE REGISTRATION, PRODUCTION, AND TIRES USED (SHIPMENTS) ON
NEW AND ON OLD CARS

Years	<i>Automobile Registration</i>		<i>Auto Production</i>	<i>Difference</i> (4)	<i>New Cars</i> (5)	<i>Old Cars</i> (6)
	<i>Yearly</i> (1)	<i>Increase</i> (2)	(3)			
1918.....	5,853					
1919.....	7,144	1,291	1,601.5	310.5	6,406.0	
1920.....	8,380	1,236	1,882.8	646.8	7,531.2	
1921.....	9,483	1,103	1,535.3	432.3	6,130.2	17,141
1922.....	10,960	1,477	2,340.0	863.0	9,360.0	20,630
1923.....	13,540	2,580	3,636.7	1,056.7	14,546.8	19,346
1924.....	15,461	1,921	3,145.0	1,224.0	12,580.0	25,425
1925.....	17,496	2,035	3,678.3	1,643.3	14,713.2	29,811
1926.....	19,237	1,741	3,765.1	2,024.1	15,060.4	29,190
1927*.....	21,448*	2,211*	4,318.5*	2,107.5*	17,274.0*	32,641

* Estimated.

Unit: Thousands.

Source: Commerce Yearbook, 1926, p. 431.

Relation of Automobile Registration to Tire Shipments.—Since it seemed possible to forecast automobile registration with considerable accuracy, a study was made to find if there were any considerable degree of similarity between tire shipments and automobile registration. Published statistics on tire shipments have been available since 1921. The data regarding automobile registration and casings shipped are plotted in Figure 29. A coefficient of correlation was computed to show the degree of similarity between casing shipments

¹ During the early part of the second quarter it was announced that the Ford Motor Company would discontinue the manufacture of their T Model automobile. This curtailment in production would have made it necessary to revise the registration forecast for 1927. Had the Mileage Tire Company been a furnisher of original equipment for the Ford Car, a revision in plans for the future would have had to be made. Since a large number of Fords would have been discarded during the year that were not discarded because of the decline in production, the company was in a good position to realize the inventory decline which was desired.

and automobile registration. This statistical measure showed a high degree of similarity between tires shipped and automobile registration, but the series are for so short a period that no definite conclusion could be reached as to the reliability of the coefficient of correlation which was obtained.

A comparison of the degree of similarity of casing shipments and automobile registration may be made by inspection. If the two lines were parallel, this would indicate that there was perfect similarity. Since the lines are not parallel, this indicates that a forecast of automobile registration cannot be used accurately to forecast casing shipments. There are several reasons why the two lines are not parallel, some of which follow: (1) the life of tires and of automobiles is not proportional, and while the life of each is increasing, the life of a casing appears to be increasing somewhat faster proportionately than the life of automobiles; (2) business conditions do affect the sale of the commodities but not proportionally.

It is a known fact that tires do not last as long in use in some states as they do in others. This is true also for counties within a state where physical conditions are different. Tires that are in service on rough and rocky roads do not last as long as those used on better roads. The extent to which better roads affect the time tires are in use, is an unknown factor which works upon the data in mass. The quality of tires produced during the past few years has improved materially and this affects the consumption of tires per automobile. It appears that the average tire also runs a greater number of miles per period of time than formerly. Better roads as well as better quality of tires have contributed greatly toward these results.

Table 39 shows the yearly automobile registration and the increase in registration over the past year. This yearly increase subtracted from the yearly production of automobiles (Column 3) gives the approximate number of automobiles discarded during each year. The tires used on new automobiles, computed as four tires per automobile, is shown in Column 5. The difference between the number of tires used on new automobiles and the total shipments gives the number of tires that are used on automobiles that have been registered more than once, or on old cars.

Forecasting Total Tire Shipments.—A knowledge of the total tire shipments should enable the Mileage Tire Company to know the

approximate number of tires they must sell in order to secure their share of the total business. There are several ways of making this forecast. For the purposes of the Mileage Tire Company, the use of a straight-line projection is utilized. Table 40 shows the values

TABLE 40
THE FORECAST OF TIRE SHIPMENTS IN THE UNITED STATES

Equation: $y = 35,655.50 + 2,037.27 x$

	(1)	(2)	(3)	(4)	(5) Y
Years	x	y	xy	x ²	Computed
1921.....	- 5	23,271	- 116,355	25	25,469
1922.....	- 3	29,990	- 89,970	9	29,544
1923.....	- 1	33,893	- 33,893	1	33,618
1924.....	+ 1	38,005	+ 38,005	1	37,694
1925.....	+ 3	44,524	+ 133,572	9	41,767
1926.....	+ 5	44,250	+ 211,250	25	45,841
		<hr/>	<hr/>	<hr/>	
		213,933	+ 142,609	70	
1927.....	+ 7				49,915*

*Estimated.

Unit: thousands.

used in determining the equation, $y = 35,655.5 + 2,037.27 x$, and Y computed, Column 5, shows a forecast of 49,915,000 casings to be shipped during 1927.

The objection may be raised that since automobile registration appears to follow an exponential curve, it should follow that tire shipments should follow somewhat the same type of curve. A forecast for tires based upon a straight line would tend to overstate the number of tires that should be shipped. The data plotted in Figure 29 show that automobile production does not progress at a steady rate; that is, it is affected by business conditions. This, however, does not appear to affect the registration of automobiles, but it does appear to affect the shipment of tires to some extent.¹ This may be explained largely by the fact that when automobile production is high the discarding of cars is high, so that the new tires are placed on new instead of on old automobiles.

It should be emphasized that prudence must be exercised in forecasting, and that when a forecast is based upon a line of trend with so short a period as required to be used here, serious errors may be made. To avoid such errors, forecasts of basic series, such as the

¹ As indicated previously, 1927 data were affected by the closing of the Ford plants.

registration of automobiles, in the present case, should be made and used to temper the forecast. The use of an exponential curve in the forecast of casings shipped for 1927 would result in a forecast that appeared too low. The forecast of automobile registration and a knowledge of tire consumption per automobile, indicated that the use of a straight line for forecasting casing shipments in 1927 would be nearer the truth than an exponential curve similar to that used in forecasting automobile registration.

The forecast of casings shipped may be partially checked by a knowledge of the degree of relationship that exists between automobile registration and casings shipped. The data for this calculation are available for only six years (1921-1926). The yearly automobile registration is shown in Table 39, and casing shipments are shown in Table 40, Column 2. These data were manipulated by the statistical method to obtain the degree of correlation or similarity and to secure an equation with which to forecast tire shipments. The correlation was found to be $r = .979$.¹ The equation is $Y = 4,554.3 + 2.1654 X$, where the unit is 1000. If automobile registration be 21,448,000 for 1927, then casing shipments should be 51,000,000 ($21,448,000 \times 2.1654 + 4,554,300 = 50,997,799$). If we may place any reliance in the similarities between automobile registration and casing shipments, where so short a period is used, it would appear that a forecast of 49,915,000 casings, obtained by means of a straight-line forecast, is conservative.

Forecast of Passenger Car Production.—The data for automobile production are shown in Table 39. These data are plotted in Figure 29. The facts set forth in Table 39 disclose that approximately one-third of the total casings shipped since 1924 have been used on new automobiles. From this fact, and those mentioned above, it seems as if any forecast of tire shipments should give some consideration to probable automobile production, even if it has been shown that total tire shipments fluctuate but little whether automobile production is high or low. This precaution would probably not be necessary if the data on automobile registration and tire shipments were available for a longer period of time.

The equation for a straight line fitted to the production data for automobiles is $y = 2.698.1 + 180.05 x$, where x is a semiannual value,

¹ The correlations in this chapter are made from annual data. In each case the trend is upward, but it appears that there should be a relationship between the several data correlated even though the period is too short to establish a reliable correlation.

with origin at July 1, 1923. The unit is 1000 automobiles. At July 1, 1927, the value of x is 9. Substituting this value of x in the equation, a forecast for 1927 of 4,318,500 automobiles is obtained. This forecast seems to be adequate for the purposes of the Mileage Tire Company.

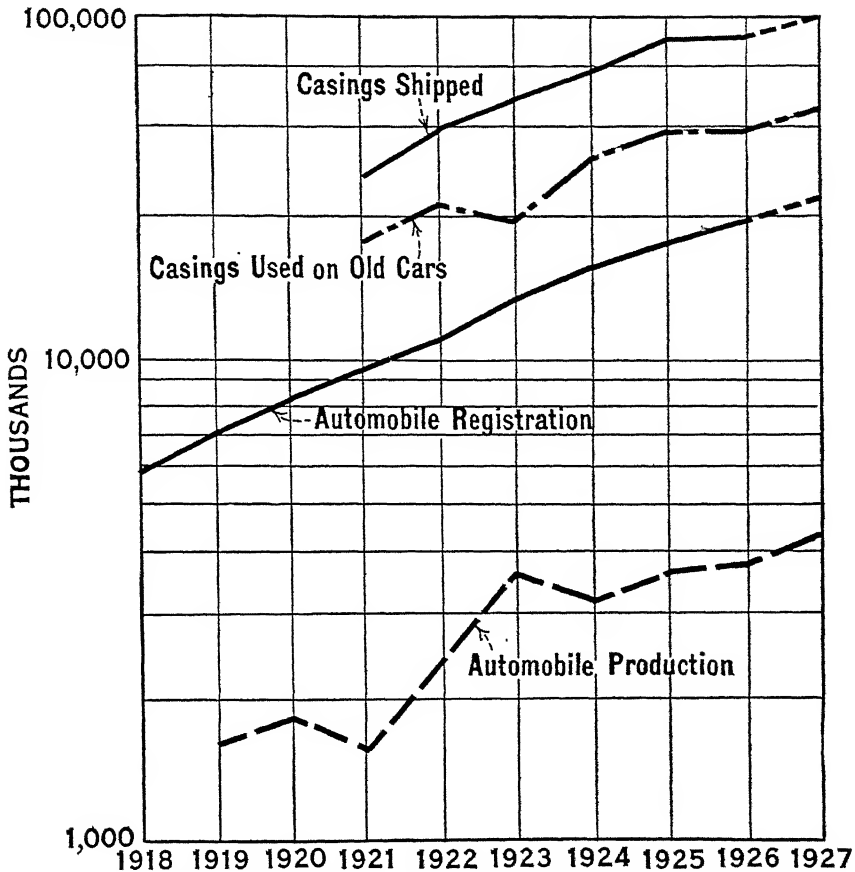


Figure 29. Automobile Production, Casings Shipped, Automobile Registration, and 1927 Forecast for each.

The above forecast of automobile production may be checked by a forecast based upon the relationship between automobile production and automobile registration. The data shown in Table 39, Columns 1 and 3, were manipulated by the statistical method to ascertain the degree of similarity or the correlation between passenger automobile production and total automobile registration. The data were available for only eight years (1919-1926). A value of .928 was found for

r which indicates that a fairly high degree of similarity exists between automobile registration and the production of passenger automobiles.

The equation for the line of trend used in determining the degree of similarity between automobile registration and automobile production was found to be: $Y = 129.9 + .2021 X$, where the unit is 1000 automobiles. If automobile registration for 1927 should be 21,448,000, then automobile production should be computed as follows: $21,448,000 \times .2021 + 129,900 = 4,464,540$. The forecast of the production of 4,464,540 automobiles on this basis compares favorably with the forecast of 4,318,500 based upon a straight line applied to past production of automobiles.

TABLE 41

PNEUMATIC CASING PRODUCTION AND 1927 FORECAST

Equation: $y = 36,105.3 + 4,795.66 b$ (annual basis)

	(1)	(2)	(3)	(4)	(5)
					\bar{Y}
Years	x	y	xy	x^2	Computed
1921.....	- 5	21,829	- 109,145	25	24,116
1922.....	- 3	30,699	- 92,097	9	28,912
1923.....	- 1	33,944	- 33,944	1	33,707
1924.....	+ 1	38,726	+ 38,726	1	38,503
1925.....	+ 3	45,431	+ 136,293	9	43,299
1926.....	+ 5	46,003	+ 230,015	25	48,096
		<hr/>	<hr/>	<hr/>	
		216,632	+ 169,848	70	
1927.....	+ 7				52,890*

*Estimated.

Unit: 1000 tires.

Source: Rubber Association of America, Inc.

Forecasting Pneumatic Casing Production.—A knowledge of probable tire shipments should be accompanied by a knowledge of probable production to fill these shipments. This should give some indication as to the probable increase or decrease in stocks. A straight line fitted to the data in Table 41, when extended for a year, indicates that 52,890,000 casings will be produced during the year and this will increase the stocks by almost 3,000,000 tires. The stocks at December 31, 1926, were 7,843,000. The increases in stocks, between the beginning and end of the year, were as follows: 1926—1,737,000; 1925—1,493,000; 1925—1,159,000. From this it would appear that a 3,000,000 increase in tire stocks would be excessive and that production and sales should be coordinated properly.

Monthly and quarterly forecasts of production and stocks are computed and checked periodically, but they are not given here.

Analysis of Casing Production.—Generalities have their value in forecasting. In the operation of a business, however, these generalities should be analyzed into major component parts so that specific information may be obtained for the operation of the several parts of the business. The quarterly production of pneumatic casings by classes is graphically presented in Figure 30. The production of fabric casings,

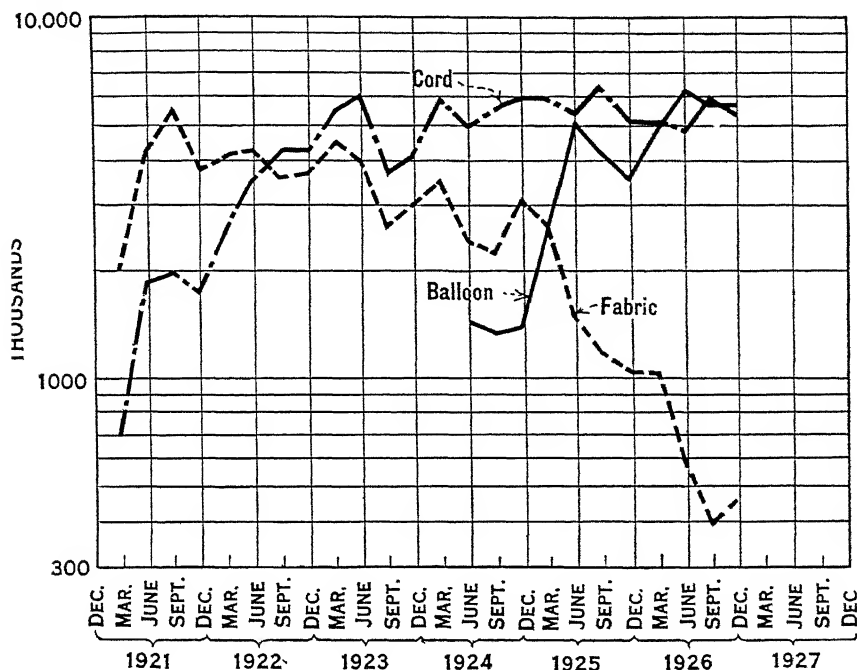


Figure 30. Quarterly Production of Pneumatic Casings, 1921-1926, inclusive.¹

which was higher than cord tires prior to June, 1922, gradually fell until they are no longer fabricated by the Mileage Tire Company.

Analysis of Cord Tires.—Statistics covering the quarterly production, shipments, and stocks of cord tires are charted in Figure 31.

Analysis of High Pressure Tubes.—The statistics of quarterly production, shipments, and stocks of high pressure inner tubes for the years 1921 to 1926 inclusive are charted in Figure 32. The large shrinkage in stocks during the first half of 1926 was due largely to the instability of rubber prices and to the sharp decline in shipments. The year 1926 may be classed as a "year of blunders" by tube manufac-

¹ *Op. cit.*

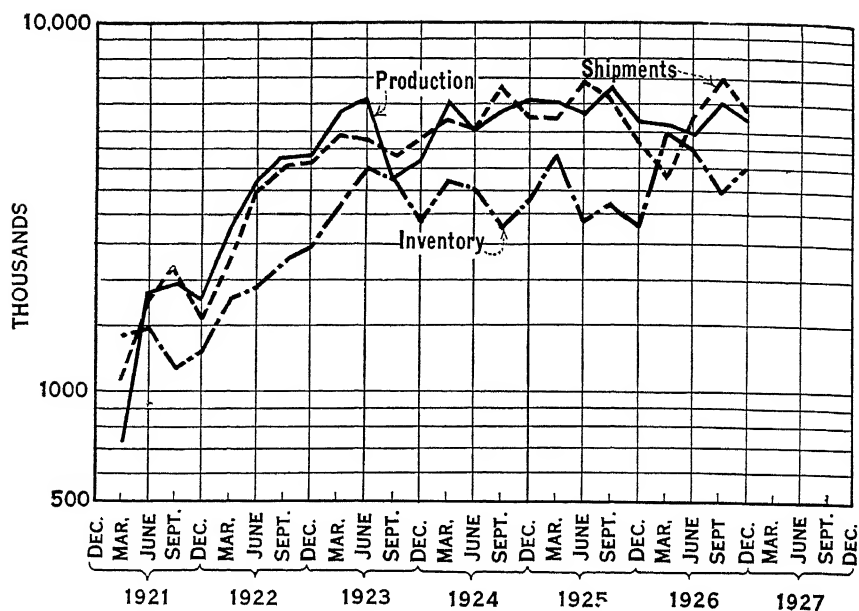


Figure 31. Quarterly Production, Shipments and Stocks of High Pressure Cord Tires.¹

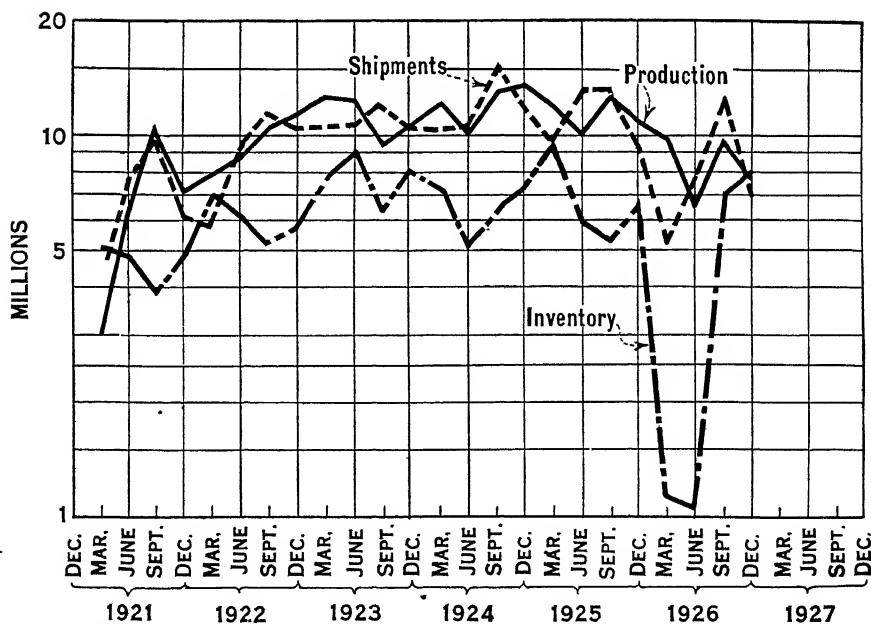


Figure 32. Quarterly Production, Shipments and Stocks of High Pressure Inner Tubes, 1921-1926, inclusive.¹

¹ *Op. cit.*

turers. Rubber prices dropped from \$1.00 per pound in January to 43 cents in June.

Analysis of Balloon Tires and Tubes.—Quarterly statistics covering production, shipments, and stocks of balloon tires and tubes are charted in Figure 33. In view of the high prices of rubber, which prevailed during the first half of 1926, it does not seem that inventories should have been increased as fast as they were.

Crude Rubber Prices.—Fluctuations in the price of crude rubber, if not adequately forecast, tend toward uncertainty in the tire and

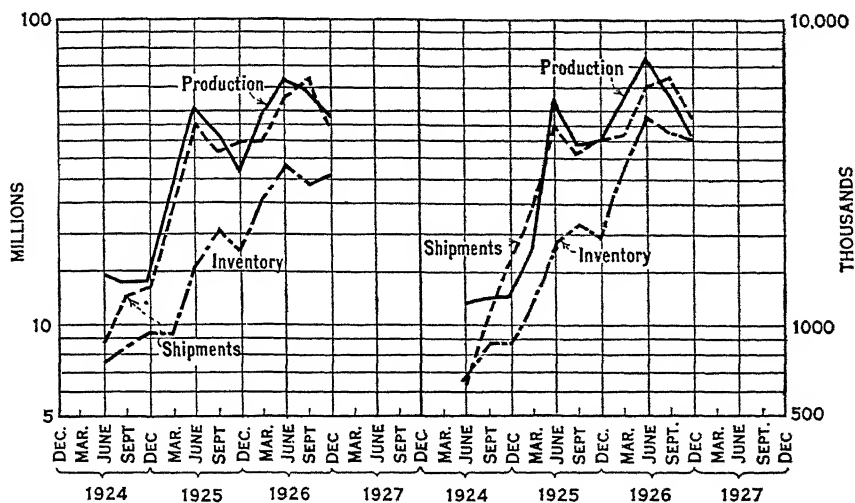


Figure 33. Quarterly Production, Shipments and Stocks of Balloon Casings and Inner Tubes.¹

tube business. Table 42 shows the monthly price of crude rubber. Prices rose from 14.5 cents per pound in September, 1922, to 35.5 cents in February, 1923, or about 147 per cent. From this point they declined to about 18.9 cents in June, 1923, then rose rapidly and reached 104.2 cents in July, 1924. After some uncertainty, prices declined from 104.8 cents per pound in November, 1925, to 38.2 cents in December, 1926. This decline would be equivalent to a 253 per cent increase, if the facts were reversed. It should be said, however, that these great fluctuations in the price of rubber are not absorbed immediately by increases or decreases in the price of the finished product.

Due to the extreme fluctuations in the price of crude rubber and

¹ *Op. cit.*

the short period of time over which the data cover anything like comparable figures, forecasting by use of simple statistical means is out of the question. The lack of simple methods of forecasting, however, makes it most imperative to forecast prices.

TABLE 42
CRUDE RUBBER PRICES

1919	1920	1921	1922	
52.0	55.0	16.0	19.2	JAN.
54.0	52.0	19.8	16.0	FEB.
54.5	46.0	18.8	14.4	MAR.
50.0	46.0	16.5	16.1	APR.
47.5	42.8	17.3	15.3	MAY
45.5	38.3	14.5	14.9	JUNE
39.0	35.0	12.8	14.8	JULY
40.0	29.5	14.5	14.2	AUG.
44.0	30.3	13.8	14.5	SEPT.
48.5	24.1	15.8	19.9	OCT.
52.0	19.8	16.8	24.1	NOV.
57.8	17.5	20.0	27.5	DEC.
48.7	36.3	16.4	17.6	AVERAGE

1923	1924	1925	1926	
32.7	26.0	36.4	79.6	JAN.
35.5	25.4	35.6	62.1	FEB.
34.6	23.0	41.3	58.4	MAR.
32.7	22.8	44.5	50.9	APR.
28.7	19.7	57.1	48.1	MAY
27.3	18.9	77.1	43.1	JUNE
26.0	21.2	104.2	41.3	JULY
29.2	26.3	80.8	38.0	AUG.
29.3	27.7	89.3	41.3	SEPT.
27.0	31.4	99.6	42.7	OCT.
27.3	34.3	104.8	39.9	NOV.
26.7	38.1	100.0	38.2	DEC.
29.7	26.2	72.5	48.6	AVERAGE

Units: Average of one price weekly, in cents per pound; Ribbed, Smoked Sheets, Spot at New York.

CHAPTER XXVI

BUDGETS OF THE MILEAGE TIRE COMPANY

Estimated Balance Sheets.—The estimated balance sheet is an instrument through which the policies of an enterprise find expression in terms of a definite future period. The administrators of a business, as well as the stockholders and others, wish to know what the financial status of the enterprise will be at some future date. Indeed, they would like to know what the future holds for them as investors. A number of concerns have demonstrated that it is perfectly feasible to forecast balance sheets with a high degree of accuracy. The length of time for which the forecast can be made depends upon the nature of the business and the degree of accuracy expected.

The directors of the Mileage Tire Company do not think that a balance sheet, upon which definite action is to be taken, should be for a longer period than three months. Tentative balance sheets, however, are prepared for a year in advance. A forecast of plant requirements, unit sales, and other forecasts are made as far in advance as the management and administrators think prudent.

The estimated balance sheet for each quarter was prepared before the beginning of the quarter. These estimated balance sheets are shown in Exhibit AA. Numerous data which support the estimated balance sheets accompany Exhibit AA. These schedules are numbered for convenient reference and may be understood more easily by means of an illustration, which follows: Schedule AA-2 or simply, AA-2, refers to the estimated finished goods at standard cost.

Analysis of Estimated Finished Goods.—In order to estimate the cost of finished goods that will be on hand at a future date, the following information should be available in units and prices: (1) the initial inventory and the inventory at the end of the period; (2) the estimated goods to be finished; (3) those to be sold. The goods to be finished depends upon the other factors mentioned.

Schedule AA-2-1 gives the data used in the determination of the goods to be finished quarterly. It should be observed that in case of estimated price changes at the end of a quarter, the inventory at the

ACCOUNTING FOR EXECUTIVE CONTROL

THE MILEAGE TIRE COMPANY

Estimated Balance Sheets

EXHIBIT AA

	January 1, 1926	March 31, 1926	June 30, 1926	September 30, 1926	December 31, 1926	
<i>Assets</i>						
Current assets:						
Cash, U. S. Govern- ment securities, and debts						
Receivable:						
Cash	\$ 9,210,000	\$ 8,400,000	\$ 6,930,000	\$ 12,480,000	\$ 16,500,000	
U. S. securities..	5,986,900	5,986,900	5,986,900	5,986,900	5,986,900	
Notes, loans and acceptances...	3,900,000	2,900,000	2,900,000	3,950,000	3,200,000	
Accounts receiv- able, net.....	16,000,000	10,082,079	11,665,214	18,831,937	15,228,862	
	<u>\$ 35,096,900</u>	<u>\$ 27,368,979</u>	<u>\$ 27,482,114</u>	<u>\$ 41,248,837</u>	<u>\$ 40,915,762</u>	AA-1
Merchandise, mate- rials and goods in process:						
Finished goods...	\$ 5,666,338	\$ 10,492,525	\$ 9,824,724	\$ 4,193,216	\$ 5,084,518	AA-2
Goods in process..	8,430,515	8,300,162	8,854,250	7,309,000	6,249,900	AA-3
Material and sup- plies..	6,300,000	6,900,000	8,050,000	6,900,000	6,700,000	AA-4
Materials and sup- plies in transit..	4,630,000	9,230,000	8,230,000	7,180,000	4,630,000	AA-5
	<u>\$ 25,026,853</u>	<u>\$ 34,922,687</u>	<u>\$ 34,958,974</u>	<u>\$ 25,582,216</u>	<u>\$ 22,664,418</u>	
Total current assets	<u>\$ 60,123,753</u>	<u>\$ 62,291,667</u>	<u>\$ 62,441,088</u>	<u>\$ 66,831,053</u>	<u>\$ 63,580,180</u>	AA-1
Properties, plants and securities:						
Land.....	\$ 1,211,320	\$ 1,211,320	\$ 1,211,320	\$ 1,211,320	\$ 1,211,320	
Buildings. . . .	15,921,388	15,921,388	15,921,388	15,921,388	15,921,388	
Machinery and equipment	30,890,621	30,990,000	31,600,000	32,000,000	32,040,000	
Moles, cores and poles...	2,089,165	2,140,000	2,300,000	2,300,000	2,310,000	
Miscellaneous items	167,869	170,000	170,000	170,000	175,000	
	<u>\$ 50,280,365</u>	<u>\$ 50,432,708</u>	<u>\$ 51,202,708</u>	<u>\$ 51,602,708</u>	<u>\$ 51,657,708</u>	
Less: reserve for de- preciation....	<u>8,982,656</u>	<u>10,133,940</u>	<u>11,587,587</u>	<u>12,627,559</u>	<u>13,717,289</u>	AA-6
Net value. . . .	<u>\$ 41,297,709</u>	<u>\$ 40,298,768</u>	<u>\$ 39,615,121</u>	<u>\$ 38,975,149</u>	<u>\$ 37,940,418</u>	
Prepaid, deferred and misc. assets...	1,688,000	1,000,000	980,000	1,000,000	970,000	AA-7
Good will, patents and trademarks ..	1	1	1	1	1	
	<u>\$ 1,688,001</u>	<u>\$ 1,000,001</u>	<u>\$ 980,001</u>	<u>\$ 1,000,001</u>	<u>\$ 970,001</u>	
Total assets....	<u>\$103,109,463</u>	<u>\$103,590,436</u>	<u>\$103,036,211</u>	<u>\$105,806,204</u>	<u>\$102,490,600</u>	

end of the period should be written down to the estimated standard. The information given here is for balloon tires and balloon tubes. The corresponding data for the other products have been omitted to conserve space. During the year the decline in the prices of rubber

THE MILEAGE TIRE COMPANY

Liabilities and Net Worth

EXHIBIT AA-1

Liabilities

Current liabilities:

Notes, loans and acceptances....	\$ 8,200,000	\$ 11,000,000	\$ 10,200,000	\$ 9,800,000	\$ 8,600,000
Accounts payable....	4,850,000	6,031,236	6,000,000	6,200,000	3,700,000
Accrued pay roll....	690,000	600,000	700,000	650,000	400,000
Accrued taxes and interest.....	410,263	400,000	300,000	300,000	580,000
Misc. items payable.	80,000	60,000	52,211	52,204	56,600
Provision for income taxes.....	1,890,000	300,000	180,000	100,000	350,000
Total current liabilities.....	\$ 16,120,263	\$ 18,391,236	\$ 17,432,211	\$ 17,102,204	\$ 13,686,600

Net Worth

Capital Stock, Comm. \$	30,000,000	\$ 30,000,000	\$ 30,000,000	\$ 30,000,000	\$ 30,000,000
Capital Stock, Pfd. .	25,504,000	25,504,000	25,504,000	25,504,000	25,504,000
General Reserve....	8,900,000	8,700,000	8,000,000	8,300,000	9,500,000
Appropriated Surplus ...	15,985,200	15,895,200	15,100,000	14,800,000	14,900,000
Free Surplus.....	6,600,000	5,100,000	7,000,000	10,100,000	8,900,000
	\$ 86,989,200	\$ 85,199,200	\$ 85,604,000	\$ 88,704,000	\$ 88,804,000
Grand Total	\$103,109,463	\$103,590,436	\$103,036,211	\$105,806,204	\$102,490,600

THE MILEAGE TIRE COMPANY

Estimated Finished Goods, Standard Cost

AA-2

Date	Total	High				
		Cord Tires	Fabric Tires	Pressure Tubes	Balloon Tires	Balloon Tubes
Jan. 1, 1926	\$ 5,666,338	\$2,336,971	\$123,700	\$371,980	\$2,413,269	\$420,417
Mar. 31, 1926:						
End.....	10,492,525	5,038,838	139,678	898,863	3,901,924	513,220
Beginning	10,269,629	5,001,599	131,288	920,728	3,719,800	496,212
June 31, 1926:						
End.....	9,824,724	4,724,863	259,186	1,007,613	3,250,281	582,779
Beginning	9,513,388	4,758,869	252,289	944,325	3,017,223	540,681
Sept. 30, 1926:						
End.....	4,193,216	2,087,504	353,677	428,723	832,022	491,289
Beginning	3,919,975	1,901,952	332,437	424,235	793,091	468,260
Dec. 31, 1926:						
End.....	5,084,518	2,128,601	—0—	467,264	1,924,147	564,505

and the increases in efficiency in the factories caused declines in final inventory values, except for the last quarter. These changes did not become apparent until some time during the several quarters.

Analysis of Estimated Goods in Process.—The estimate of goods in process at the end of any quarter or period should be planned

THE MILEAGE TIRE COMPANY

Analysis of Estimated Finished Goods

AA-2-1

<i>Balloon Tires</i>	<i>Units</i>	<i>Prices</i>	<i>Amount</i>	<i>Amount</i>	<i>Prices</i>	<i>Units</i>
Initial inventory ..	255,000	\$9 4638	\$ 2,413,269	\$ 8,542,972	\$9 4638	902,700 Sales
Finished goods ...	1,060,000	9.4638	10,031,628	3,834,183	9.2995	412,300 Inventory
				67,740		Adjustment
First quarter....	1,315,000		\$12,444,897	\$12,444,897		1,315,000
Initial inventory ..	400,000	\$9.2995	\$ 3,719,800	\$11,842,913	\$9.2995	1,273,500 Sales
Finished goods....	1,210,000	9 2995	11,373,395	3,076,653	9.1431	336,500 Inventory
				173,628		Adjustment
Second quarter..	1,610,000		\$15,093,195	\$15,093,195		1,610,000
Initial inventory ..	330,000	\$9.1431	\$ 3,017,223	\$12,699,765	\$9.1431	1,389,000 Sales
Finished goods....	1,150,000	9 1431	10,514,565	820,128	9.0124	91,000 Inventory
				11,893		Adjustment
Third quarter...	1,480,000		\$13,531,788	\$13,531,788		1,480,000
Initial inventory ..	88,000	\$9 0124	\$ 793,091	\$ 8,422,087	\$9.0124	934,500 Sales
Finished goods ...	1,060,000	9.0124	9,553,144	1,924,147	9.0124	213,500 Inventory
Fourth quarter..	1,148,000		\$10,346,235	\$10,346,235		1,148,000
<i>Balloon Tubes</i>						
Initial inventory ..	270,000	\$1 5571	\$ 420,417	\$ 1,503,224	\$1 .5571	965,400 Sales
Finished goods....	1,025,000	1 5571	1,596,027	496,212	1.5055	329,600 Inventory
				17,007		Adjustment
First quarter....	1,295,000		\$ 2,016,444	\$ 2,016,444		1,295,000
Initial inventory ..	329,600	\$1.5055	\$ 496,212	\$ 2,058,771	\$1.5055	1,367,500 Sales
Finished goods ...	1,425,000	1 5055	2,145,337	565,669	1.4613	387,100 Inventory
				17,109		Adjustment
Second quarter..	1,754,600		\$ 2,641,550	\$ 2,641,550		1,754,600
Initial inventory ..	370,000	\$1.4613	\$ 540,681	\$ 2,051,372	\$1.4613	1,403,800 Sales
Finished goods....	1,370,000	1.4613	2,001,981	484,396	1.4408	336,200 Inventory
				6,892		Adjustment
Third quarter...	1,740,000		\$ 2,542,662	\$ 2,542,662		1,740,000
Initial inventory ..	325,000	\$1.4408	\$ 468,260	\$ 1,459,818	\$1.4408	1,013,200 Sales
Finished goods....	1,080,000	1.4408	1,556,064	564,505	1.4408	391,800 Inventory
Fourth quarter..	1,405,000		\$ 2,024,324	\$ 2,024,324		1,405,000

definitely. Units and prices should be used in each computation, wherever it is feasible to use these factors. If units and prices are to be used for goods in process, some logical divisions for each product must be made. The Mileage Tire Company makes this division along departmental lines. Tires pass through specified processes. These processes are performed in departments. As a thousand tires pass from one process to another and from department to department, spe-

THE MILEAGE TIRE COMPANY					
<i>Estimated Goods in Process</i>					
	AA-3				
<i>Items</i>	<i>January 1, 1926</i>	<i>March 31, 1926</i>	<i>June 30, 1926</i>	<i>Sept. 30, 1926</i>	<i>December 31, 1926</i>
Balloon tires AA-3-1.	\$3,697,200	\$2,976,000	\$3,680,000	\$3,240,000	\$2,854,400
Balloon tubes.....	731,000	682,500	630,750	644,000	624,000
.....					
To AA.....	<u>\$8,430,515</u>	<u>\$8,300,162</u>	<u>\$8,854,250</u>	<u>\$7,309,000</u>	<u>\$6,249,900</u>

NOTE: This schedule gives the monetary value of the several items of estimated goods in process. The subsidiary records, which support these items, carry the necessary details to cover units and prices.

cified portions of the work are finished. The standard cost of tires is analyzed so as to show the cost of tires at each stage of completion.

To illustrate: in AA-3-1 the inventory of balloon tires at March 31, 1926, is shown as 320,000 units at \$9.30 each or a total inventory of \$2,976,000. The units are at various stages of completion. The price of \$9.30 is a general average price. Some of the inventory will be nearly completed while other portions of it will have just entered into process. If the several units at the various phases in process be multiplied by the standard cost of the items at the several stages of process, the product will be the total inventory. The price is therefore an average and is found by dividing the units by the total inventory.

It should be observed that the initial inventory of goods in process is stated at cost. The estimated finished goods are transferred to finished goods at the cost prices to be used in stating the cost of goods sold.

Inventory Adjustments in Finished Goods.—At the end of any budget period the standard cost of finished goods may be less than the actual cost. In such an event, the difference between actual cost and standard cost should be written off. The necessity for such an adjustment is shown for high pressure tubes, as follows:

Inventory, January 1, 1926.....	280,000 Units @ \$1.3285	\$ 371,980
Goods to be finished.....	1,800,000 Units @ \$1.3285	2,391,300
		<u>\$2,763,280</u>
Estimated sales.....	1,403,400 Units @ \$1.3285	\$1,864,416
Inventory, March 31, 1926.....	676,600 Units @ \$1.2968	877,414
Price adjustment AA-3-1-a.....		21,448
		<u>\$2,763,280</u>

This shows that the inventory at March 31, 1926, is to be lowered to a unit value of \$1.2968. The amount of unabsorbed cost in the account is carried to profit and loss. The estimated finished goods for each quarter are shown in AA-3-1-a.

THE MILEAGE TIRE COMPANY

Analysis of Estimated Goods in Process

AA-3-1

Balloon Tires

<i>Items</i>	<i>Units</i>	<i>Prices</i>	<i>Amounts</i>	<i>Amounts</i>	<i>Prices</i>	<i>Units</i>	<i>Items</i>
Initial inventory....	390,000	\$9 4800	\$ 3,697,200	\$10,031,628	\$9 4638	1,060,000	Finished
Processed.....	990,000	9 4044	9,310,428	2,976,000	9.3000	320,000	Inventory
First quarter... ..	1,380,000		\$13,007,628	\$13,007,628		1,380,000	
Inventory, initial ..	330,000	9 3400	\$ 3,082,200	\$11,373,395	9.2995	1,210,000	Finished
Processed.....	1,280,000	9.3525	11,971,195	3,680,000	9.2000	400,000	Inventory
Second quarter... ..	1,610,000		\$15,053,395	\$15,053,395		1,610,000	
Initial inventory....	410,000	\$9.200	\$ 3,772,000	\$10,514,565	9.1431	1,150,000	Finished
Processed.....	1,100,000	9.0750	9,982,565	3,240,000	9.0000	360,000	Inventory
Third quarter... ..	1,510,000		\$13,754,565	\$13,754,565		1,510,000	
Initial inventory ...	380,000	\$9.0000	\$ 3,420,000	\$ 9,553,144	9 0124	1,060,000	Finished
Processed.....	1,000,000	8.9875	8,987,544	2,854,400	8.9200	320,000	Inventory
Fourth quarter... ..	1,380,000		\$12,407,544	\$12,407,544		1,380,000	

THE MILEAGE TIRE COMPANY

Inventory Adjustment Estimated Finished Goods

AA-3-1-a

<i>Items</i>	<i>1926 Total</i>	<i>First Quarter</i>	<i>Second Quarter</i>	<i>Third Quarter</i>
Balloon tires.....	\$253,263	\$ 67,740	\$173,628	\$11,893
Balloon tubes.....	41,009	17,007	17,109	6,892
	<u>\$535,880</u>	<u>\$151,825</u>	<u>\$308,894</u>	<u>\$75,160</u>

Estimated Materials and Supplies.—The estimated materials and supplies in stores are shown in AA-4. The estimates for the several items were made after a careful study of past performance, the requirements of the manufacturing program, and the probable prices of the items listed. Due to the financial arrangement which the company has with the suppliers of certain raw materials, large payments are made against shipments in route. Such materials are shown in AA-5 as estimated materials and supplies in transit.

Normal Depreciation.—The Mileage Tire Company charges depreciation into cost on the basis of normal capacity. Studies were made

THE MILEAGE TIRE COMPANY

Estimated Materials and Supplies

AA-4

<i>Items</i>	<i>January 1, 1926</i>	<i>March 31, 1926</i>	<i>June 30, 1926</i>	<i>September 30, 1926</i>	<i>December 31, 1926</i>
Crude rubber.....	\$5,100,000	\$5,500,000	\$6,500,000	\$5,500,000	\$5,400,000
Textiles.....	1,000,000	1,100,000	1,200,000	1,100,000	1,000,000
Other materials....	200,000	300,000	350,000	300,000	300,000
To AA.....	\$6,300,000	\$6,900,000	\$8,050,000	\$6,900,000	\$6,700,000

THE MILEAGE TIRE COMPANY

Estimated Materials and Supplies in Transit

AA-5

<i>Items</i>	<i>January 1, 1926</i>	<i>March 31, 1926</i>	<i>June 30, 1926</i>	<i>September 30, 1926</i>	<i>December 31 1926</i>
Crude rubber.....	\$4,500,000	\$9,000,000	\$8,000,000	\$7,000,000	\$4,500,000
Textiles.....	100,000	200,000	200,000	150,000	100,000
Other materials....	30,000	30,000	30,000	30,000	30,000
To AA.....	\$4,630,000	\$9,230,000	\$8,230,000	\$7,180,000	\$4,630,000

to determine the operating capacities of the several plants. The estimated value of the assets employed in the business is shown in Table 43. The asset values have been grouped according to the executive under whose direction the assets are employed. The normal depreciation rates, which the directors feel should be applied to return the investment, are shown at the bottom of Table 43. When these rates of depreciation are applied to the asset values, the normal depreciation for each asset is obtained.

The general concept of normal depreciation is that over a cycle of years the depreciation charged to cost will be equal to a specified annual rate on the assets. The directors of the company hold this view of depreciation. It should be observed, however, that the cycles in the tire business appear to be undetectable. In view of these facts, the policy of the company is to charge costs with an amount which will yield approximately specified rates. The seasonal factor in sales is pronounced, and the policy is to eliminate this element in the unit costs of the product. That is, the sales of each year should bear the depreciation sustained.

Table 44 shows the distribution of the depreciation to the several products which are under the direction of the manager of procurement. The asset values used in each department are stated. The equipment is

TABLE 43

THE MILEAGE TIRE COMPANY

*Computation of the Normal Depreciation
Asset Values*

<i>Organization</i>	<i>Total</i>	<i>Buildings</i>	<i>Machinery and Equipment</i>	<i>Molds, Cores, and Poles</i>	<i>Miscel- laneous</i>
Chief executive... \$	118,000	\$ 100,000	\$ 18,000		
Controller.....	630,000	400,000	220,000		\$ 10,000
Manager of procurement....	43,672,000	11,700,000	29,622,000	\$2,250,000	100,000
Manager of marketing.....	3,150,000	2,180,000	940,000		30,000
Manager of personnel.....	1,880,000	1,620,000	200,000		60,000
	<u>\$49,450,000</u>	<u>\$16,000,000</u>	<u>\$31,000,000</u>	<u>\$2,250,000</u>	<u>\$200,000</u>

Normal Depreciation

Chief executive... \$	6,200	\$ 3,500	\$ 2,700		
Controller.....	48,300	14,000	33,300		\$ 1,000
Manager of procurement....	4,429,140	409,500	3,554,640	\$ 450,000	15,000
Manager of marketing.....	267,300	76,300	188,000		3,000
Manager of personnel.....	81,500	56,700	20,000		4,800
	<u>\$ 4,832,440</u>	<u>\$ 560,000</u>	<u>\$ 3,798,640</u>	<u>\$ 450,000</u>	<u>\$ 23,800</u>

Normal Depreciation Rates

Chief executive.....	3½%	15%		
Controller.....	3½%	15%		10%
Manager of procurement.....	3½%	12%	20%	15%
Manager of marketing.....	3½%	20%		10%
Manager of personnel.....	3½%	10%		8%

further analyzed by departments. The unit rates for depreciation are analyzed in a like manner.

Analysis of Estimated Depreciation.—Table 45 contains information regarding the normal capacity of each plant, the estimated sales for each quarter, the percentage of capacity used, and the normal depreciation which these sales should bear, together with the per unit depreciation.

The estimated depreciation on used and on idle capacity is shown in Table 46. Quarterly rates per unit were shown in Table 45. These

TABLE 44

THE MILEAGE TIRE COMPANY

Depreciation for the Manager of Procurement

<i>Asset Values</i>	<i>Total</i>	<i>Build- ings</i>	<i>Machinery and Equipment</i>	<i>Molds, Cores, and Poles</i>	<i>Miscel- laneous</i>
Balloon tires	\$ 16,394	\$ 4,378	\$ 11,370	\$ 606	\$ 40
Balloon tubes.....	5,472	1,472	3,441	533	26
	<u>\$ 43,672</u>	<u>\$ 11,700</u>	<u>\$ 29,622</u>	<u>\$ 2,250</u>	<u>\$ 100</u>

Unit: 1000 dollars.

Normal Depreciation

Balloon tires	\$1,644,830	\$153,230	\$1,364,400	\$121,200	\$ 6,000
Balloon tubes.....	574,940	51,520	412,920	106,600	3,900
	<u>\$4,429,140</u>	<u>\$409,500</u>	<u>\$3,554,640</u>	<u>\$450,000</u>	<u>\$15,000</u>

Go

TABLE 45

THE MILEAGE TIRE COMPANY

Analysis of Estimated Depreciation

	<i>Normal Capacity- Units</i>	<i>Estimated Sales- Units</i>	<i>Per Cent</i>	<i>Normal Depreciation Amount</i>	<i>\$ Per Unit</i>
<i>Balloon Casings</i>					
First Quarter, 1926..	1,100,000	902,700	82.0636	\$ 330,009	
Second " " ..	1,100,000	1,273,500	115.7727	465,566	
Third " " ..	1,100,000	1,389,000	126.2727	507,790	
Fourth " " ..	1,100,000	934,500	84.9545	341,635	
	<u>4,400,000</u>	<u>4,499,700</u>	<u>100.00</u>	<u>\$1,645,000</u>	<u>\$0.365580</u>
<i>Balloon Tubes</i>					
First Quarter, 1926..	1,400,000	965,400	68.9571	\$ 116,867	
Second " " ..	1,400,000	1,367,500	97.6786	165,543	
Third " " ..	1,400,000	1,403,800	100.2714	169,937	
Fourth " " ..	1,400,000	1,013,200	73.6571	122,653	
	<u>5,600,000</u>	<u>4,749,900</u>	<u>100.00</u>	<u>\$ 575,000</u>	<u>\$0.121055</u>
Total.....	23,760,000	21,059,900		\$4,430,000	

ACCOUNTING FOR EXECUTIVE CONTROL

TABLE 46

THE MILEAGE TIRE COMPANY

Depreciation on Used and on Idle Capacity

		<i>Depreciation on Capacity Used</i>		<i>Depreciation on Idle Facilities</i>	
		<i>Amounts</i>	<i>\$ Per</i>	<i>Amounts</i>	<i>\$ Per</i>
<i>Balloon Tires</i>		<i>Unit</i>		<i>Unit</i>	
First	Quarter, 1926.....	\$ 270,817	\$0.300001	\$ 59,192	\$0.065579
Second	" "	538,998	0.423242	73,432*	0.057662*
Third	" "	641,200	0.461627	133,410*	0.096047*
Fourth	" "	290,234	0.310576	51,401	0.055004
		<hr/>		<hr/>	
		\$1,741,249		\$ 96,249*	
<i>Balloon Tubes</i>					
First	Quarter, 1926.....	\$ 80,588	\$0.083476	\$ 36,279	\$0.037579
Second	" "	161,700	0.118245	3,843	0.002810
Third	" "	170,398	0.121383	461*	0.000328*
Fourth	" "	90,343	0.089166	32,310	0.031889
		<hr/>		<hr/>	
		\$ 503,029		\$ 71,971	
		<hr/>		<hr/>	
Total.....		\$4,153,442		\$276,558	

*Red, decrease.

rates are further analyzed to show used-capacity percentage shown in Table 45. The total depreciation may be summarized as follows:

<i>Quarters</i>	<i>Used Capacity</i>	<i>Idle Capacity</i>
First	\$ 594,357	\$255,560
Second.....	1,184,188	26,786
Third.....	1,615,474	209,369*
Fourth.....	759,423	203,581
	<hr/>	<hr/>
	\$4,153,442	\$276,558

*Red.

The total estimated depreciation on used and on idle capacity amounts to \$4,430,000, which is only \$860 above the amount applicable to the manager of procurement (Table 44).

Analysis of Non-Manufacturing Depreciation.—The total normal depreciation for the assets under the control of the various non-manufacturing executives is shown in Table 47. This depreciation is analyzed further to show the depreciation applicable to used capacity and to idle capacity. Unit rates are obtained and when applied to the sales of a specified period, the depreciation may be found for used and for idle capacity. During the third quarter there was no idle capacity.

TABLE 47
THE MILEAGE TIRE COMPANY
Analysis of Depreciation—Non-Manufacturing

	<i>Total</i>	<i>First Quarter</i>	<i>Second Quarter</i>	<i>Third Quarter</i>	<i>Fourth Quarter</i>
Normal capacity (units)	23,760+	5,990+	5,990+	5,890+	5,890+
Estimated sales (units)	21,059 9+	4,138.9+	5,581 6+	6,640.8+	4,698.6+
Used capacity (per cent)	88 6359	69.0968	93.1819	112.7470	79.7724
Normal depreciation	\$403,299	\$79,260	\$106,888	\$127,172	\$89,979
Normal depreciation (unit) . .		.0191501	.0191501	.0191501	.0191501
Depreciation used capacity (amount)	\$369,527	\$54,766	\$99,600	\$143,383	\$71,778
Depreciation used capacity (unit) . . . . .		.013232	.017844	.021591	.015276
Depreciation idle capacity (amount)	\$33,772	\$24,494	\$7,288	\$16,211*	\$18,201
Depreciation idle capacity (unit) . . . . .		.005918	.001306	.002441*	.003874
<i>Summary</i>					
Chief executive	\$ 6,200				
Controller	48,300				
Manager of marketing	267,300				
Manager of personnel	81,500				
	<u>\$403,300</u>				

*Red.
000 omitted.

Estimated Depreciation Reserve.—The estimated reserve for depreciation is shown in AA-6. This reserve is composed of charges for depreciation on idle plant facilities, depreciation on used and on idle non-manufacturing facilities, and depreciation on inventories. It should be observed that depreciation is shown as entering into the value of the inventories and that a corresponding deduction is made from the depreciable assets.

The estimated depreciation for the various accounts may be ascertained by multiplying the standard per unit rate by the estimated units in the several inventories. This may be illustrated by reference to estimated depreciation in the cost of goods sold in the case of balloon tires, which follows:

<i>Inventories, as at</i>	<i>Standard Per Unit Rate</i>	<i>Units</i>	<i>Estimated Depreciation</i>
March 31, 1926 . . . . .	.30001	902,700	\$270,819.03
June 30, 1926 . . . . .	.423242	1,273,500	538,988.69
September 30, 1926 . . . . .	.461627	1,389,000	641,199.90
December 31, 1926 . . . . .	.310576	934,500	290,233.27

THE MILEAGE TIRE COMPANY

Estimated Reserve for Depreciation

AA-6

Reserve for depreciation, January 1, 1926.	AA	\$ 8,982,656	
Depreciation in cost of goods sold.	BB	594,357	
Depreciation, idle plant facilities.	BB-4-ca-1	255,560	
Depreciation, idle facilities, non-manufacturing.	BB-4-ca-4	24,494	
Depreciation, idle capacity, non-manufacturing.	BB-4-ca-4	54,766	
Depreciation in inventories, increase.	AA-14-1	222,107	
		<hr/>	
Reserve for depreciation, March 31, 1926.		\$10,133,940	
Depreciation in cost of goods sold.	BB	1,184,188	
Depreciation, idle plant facilities.	BB-4-ca-1	26,786	
Depreciation, used capacity, non-manufacturing.		99,600	
Depreciation, idle capacity, non-manufacturing.		7,288	
Depreciation in inventories, increase.	AA-14-1	135,784	
		<hr/>	
Reserve for depreciation, June 30, 1926.		\$11,587,587	
Depreciation in cost of goods sold.	BB	1,615,474	
Depreciation, used capacity, non-manufacturing.		143,383	
		<hr/>	
Depreciation, idle plant facilities.	\$ 209,369		\$13,346,444
Depreciation, idle facilities, non-manufacturing.	16,211		
Depreciation in inventories, decrease.	493,305	718,885	
		<hr/>	
Reserve for depreciation, September 30, 1926.		\$12,627,559	
Depreciation in cost of goods sold.	BB	759,423	
Depreciation, idle plant facilities.		203,581	
Depreciation, used capacity, non-manufacturing.		71,778	
Depreciation, idle capacity, non-manufacturing.		18,201	
Depreciation in inventories, increase.		36,747	
		<hr/>	
Reserve for Depreciation, December 31, 1926.		\$13,717,289	
<hr/>			
<i>Summary</i>			
Reserve for depreciation, January 1, 1926.	\$8,982,656		
Less: depreciation in inventory, 1-1-'26.	453,000	\$ 8,529,656	
		<hr/>	
Depreciation in cost of goods to be sold.		4,153,442	
Depreciation on idle plant facilities.		276,558	
Depreciation, used capacity, non-manufacturing.		369,527	
Depreciation, idle capacity, non-manufacturing.		33,772	
Depreciation in inventories.		354,334	
		<hr/>	
		<u>\$13,717,289</u>	

Variations from Standard Costs in Inventories.—The inventories are stated at standard cost. Since the balance sheet is stated at cost, the difference between standard and actual cost is carried as

"deferred charges." These variations will enter profit and loss when the goods in the inventories are disposed of. The estimated amount of these variations is stated in AA-7.

THE MILEAGE TIRE COMPANY					
<i>Prepaid, Deferred and Miscellaneous Assets</i>					AA-7
<i>Items</i>	<i>Jan. 1, 1926</i>	<i>Mar. 31, 1926</i>	<i>June 30, 1926</i>	<i>Sept. 30, 1926</i>	<i>Dec. 31, 1926</i>
Variations from standard cost in finished goods, and goods in process.....	\$ 250	\$ 400	\$ 250	\$ 280	\$ 215
Other items (not specified herein)	1,438	600	730	720	755
To AA.....	<u>\$1,688</u>	<u>\$1,000</u>	<u>\$ 980</u>	<u>\$1,000</u>	<u>\$ 970</u>

Note: 000 omitted.

Estimated Profit and Loss Statement.—The estimated quarterly profit and loss statement for the year 1926 is shown in Exhibit BB. The items which enter into the determination of the standard operating profit are the result of the multiplication of standard prices times units. This process results in the statement of definite standards by which the operating results of the business may be judged. Those who are interested in the standards of operating efficiency, which the concern has set for itself, will be interested in the items which enter into the standard operating profit.

The determination of the standard operating profit is a practical application of the standard cost concept to the profit and loss statement. As indicated previously, the accounts should be constructed in such manner that variations and causes for variations can be analyzed and otherwise utilized. Such benefits may be secured by devoting sections of the profit and loss statement to the objective.

Since the net effects shown in the balance sheet are a statement of the reckoned cost or "actual cost" of the several items, the profit and loss statement should be in the same form. This aim may be secured by deducting the variations from standard from the standard operating profit before deriving the net profits for the year. Such a method of presentation makes it possible to guard against many types of errors and is valuable otherwise.

Estimated Gross Sales.—The estimated gross sales in dollars is shown in BB-1. The method of arriving at the totals for each line of products is shown in the supporting schedules. For example, in

THE MILEAGE TIRE COMPANY

Estimated Profit and Loss Statement

EXHIBIT BB

Items	Schedule	Year 1926	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
Gross sales.....	BB-1	\$156,832,203	\$30,444,400	\$42,930,400	\$49,664,258	\$33,793,145
Less: sales returns ...	BB-2	165,901	22,105	60,274	52,609	30,911
Net billings.....		\$156,666,301	\$30,422,294	\$42,870,125	\$49,611,648	\$33,762,233
Deductions from sales.	BB-3	11,625,000	2,263,500	3,171,500	3,715,000	2,475,000
Net sales.		\$145,041,301	\$28,158,794	\$39,898,625	\$45,896,648	\$31,287,233
Cost of Sales.....	BB-4	95,664,459	18,849,906	26,323,507	30,244,018	20,247,027
Gross profit.....		\$ 49,376,842	\$ 9,308,888	\$13,375,117	\$15,652,630	\$11,040,206
Marketing costs.	BB-5	25,423,511	4,996,480	6,738,107	8,016,774	5,672,150
Management costs....	BB-6	14,969,376	2,941,930	3,967,401	4,720,280	3,339,765
		\$ 40,392,887	\$ 7,938,410	\$10,705,508	\$12,737,054	\$ 9,001,915
Standard operating profit.....		\$ 8,983,955	\$ 1,370,478	\$ 2,669,609	\$ 2,915,576	\$ 2,028,291
Variations from stand- ard in:						
Cost of goods sold....	BB-7	\$ 806,446*	\$ 227,593*	\$ 182,898*	\$ 209,981*	\$ 185,072*
Marketing expense....	BB-8	73,511	673,520*	518,107	596,774	367,850*
Management expense.	BB-9	44,376	518,070*	317,401	560,280	315,235*
		\$ 688,559*	\$ 1,419,183*	\$ 652,609	\$ 947,072	\$ 869,057*
Net profit from opera- tion.....		\$ 8,295,395	\$ 48,705*	\$ 3,322,219	\$ 2,862,648	\$ 1,159,233
Other income.		\$ 8,185,936	\$ 1,460,860	\$ 2,180,200	\$ 2,700,500	\$ 1,844,376
Other deductions.....		7,586,295	1,301,000	1,995,205	2,400,000	1,890,090
Net increase.....		\$ 599,641	\$ 159,860	\$ 184,995	\$ 300,500	\$ 45,714*
Net income for the pe- riod ...		\$ 8,895,036	\$ 111,154	\$ 3,507,214	\$ 4,163,148	\$ 1,113,519
Date of Estimate.....			Dec. 15, 1925	Mar. 12, 1926	June 20, 1926	Sept. 16, 1926

* Red.

BB-1-a, the details could be given to show how the amount of the sales budget is secured. An estimate is made of the tires of the various sizes that are to be sold. This estimate is made on the basis of past experience, with proper allowance being made for probable changes in each size of tire. The manager of marketing, a merchandise manager for each type of tires and of tubes and each major official, or his representative, act as a budget committee to set the preliminary budget.

Since the budget is made out in terms of units and prices for individual sizes and classes of products, it is necessary for the committee to give due consideration to the various technical studies which are

necessary to insure against errors that are likely to occur without such studies.

Some of the details which enter into the computation of the gross sales have been omitted. The data for balloon tires and balloon tubes by sizes is omitted for the last two quarters of 1926.

THE MILEAGE TIRE COMPANY						
Estimated Gross Sales						BB-I
Items		Year 1926	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
Balloon tires.....	BB-I-c	\$66,406,685	\$13,414,200	\$18,815,000	\$20,434,668	\$13,742,817
Balloon tubes.....	BB-I-d	12,192,188	2,544,350	3,533,100	3,565,890	2,548,848
To BB		\$156,832,203	\$30,444,400	\$42,930,400	\$49,664,258	\$33,793,145

THE MILEAGE TIRE COMPANY					
<i>Estimated Balloon Casing Gross Sales</i>					
		BB-I-C			
		<i>1926</i>	<i>Units</i>	<i>Prices</i>	<i>Amounts</i>
First quarter.....			903,000	\$14.8551	\$13,414,200
Second quarter.....			1,276,000	14.7452	18,815,000
Third quarter.....			1,390,000	14.7012	20,434,668
Fourth quarter.....			935,000	14.6982	13,742,817
			<u>4,504,000</u>		<u>\$66,406,685</u>

		<i>First Quarter</i>		<i>Second Quarter</i>		
<i>Sizes</i>	<i>Units</i>	<i>Prices</i>	<i>Amounts</i>	<i>Units</i>	<i>Prices</i>	<i>Amounts</i>
27x4.40-19" ..	36,000	\$ 9.50	\$ 342,000	52,000	\$ 9.40	\$ 488,800
29x4.40-21" ..	56,000	10.10	565,600	80,000	10.00	800,000
.....						
	<u>903,000</u>		<u>\$13,414,200</u>	<u>1,276,000</u>		<u>\$18,815,000</u>

THE MILEAGE TIRE COMPANY						
Estimated Balloon Tube Gross Sales						
				BB-I-D		
1926		Units		Prices	Amounts	
First quarter.....		966,000		\$2.6339	\$2,544,350	
Second quarter.....		1,369,000		2.5808	3,533,100	
Third quarter.....		1,405,000		2.5380	3,565,890	
Fourth quarter.....		1,014,000		2.5132	2,548,848	
		<hr/>		<hr/>	<hr/>	
BB-I.....		4,754,000			\$12,192,188	
		First Quarter		Second Quarter		
Sizes	Units	Prices	Amounts	Units	Prices	Amounts
27x4.40-19" ..	40,000	\$1.75	\$ 70,000	55,000	\$1.70	\$ 39,500
29x4.40-21" ..	58,000	1.85	107,300	85,000	1.85	157,250
.....			<hr/>	<hr/>		<hr/>
	<hr/>		<hr/>	<hr/>		<hr/>
	966,000		\$2,544,350	1,369,000		\$3,533,100

Estimated Sales Returns.—The estimated sales returns are shown in BB-2. The amounts which enter into this estimate are made in units and prices for each group of products. These estimates may be made from a knowledge of past experience, tempered by a knowledge of manufacturing conditions in the factories. The estimated returns for cord tires are shown as follows:

<i>1926</i>	<i>Units</i>	<i>Prices</i>	<i>Amounts</i>
First quarter.....	1,000	\$12.2121	\$12,212.10
Second quarter.....	1,000	12.6235	12,623.50
Third quarter.....	2,000	13.0001	26,000.20
Fourth quarter.....	1,500	12.5212	18,781.80
 To BB-2.....	 5,500		 \$69,617.60

It should be observed that the return of an unusually large proportion of high-priced tires would throw the estimated price factor off and the total monetary value would be higher than estimated. The law of averages, however, tends to keep the price factor within close range of the estimate.

Estimated Deductions from Sales.—All sales are billed at the list price in force when the sale is effected. There are several classes of dealers and each class secures a different net delivery price. These deductions must be taken up in the accounts. The company tries to maintain the retail price of its products, and in doing this finds it essential to pay the freight on shipments and to make allowances, adjust-

THE MILEAGE TIRE COMPANY

<i>Items</i>	<i>Estimated Sales Returns</i>					<i>BB-2</i>
	<i>Year 1926</i>	<i>First Quarter</i>	<i>Second Quarter</i>	<i>Third Quarter</i>	<i>Fourth Quarter</i>	
Balloon casings.....	\$ 61,863	\$ 4,446	\$36,308	\$14,108	\$ 7,001	
Balloon tubes.....	9,501	1,237	3,469	2,866	1,928	
 To BB.....	 \$165,901	 \$22,105	 \$60,274	 \$52,609	 \$30,911	

ments, and other modifications in the net price. The various classes of adjustments are summarized in BB-3 and could be shown by classes in BB-3-1. Each class of adjustments is analyzed according to units, prices, and amounts for each class of commodities. This information is used in setting up the budget.

Estimated Cost of Goods Sold.—The estimated cost of goods is obtained by multiplying the standard cost of each class of commodity

THE MILEAGE TIRE COMPANY

Estimated Deductions from Sales

BB-3

<i>Items</i>	<i>Year 1926</i>	<i>First Quarter</i>	<i>Second Quarter</i>	<i>Third Quarter</i>	<i>Fourth Quarter</i>
Balloon tires.	\$ 5,487,000	\$1,135,000	\$1,532,000	\$1,680,000	\$1,140,000
Balloon tubes.	1,010,000	200,000	290,000	305,000	215,000
To BB.	<u>\$11,625,000</u>	<u>\$2,263,500</u>	<u>\$3,171,500</u>	<u>\$3,715,000</u>	<u>\$2,475,000</u>

by the number of units of each class to be sold and adding the products. The cost so obtained for each quarter of 1926 is shown in BB-4. This schedule is a summary, in dollars, of the estimated cost, at standard prices, of the several classes of products.

Further analysis of the estimated cost of goods sold is given in BB-4-1. This schedule analyzes the estimated cost of balloon tires and balloon tubes into (1) direct labor, (2) direct materials, and (3) overhead expenses. The totals for each of these analyses is secured from the multiplication of units by prices and the addition of the several products secured. In each case the cost is computed on a composite or general average basis. This general average for each line of products is analyzed by sizes, and a standard cost for each size is set. These standard costs are used in pricing the product. Other factors considered in pricing the products are mentioned in the text and illustrated.

THE MILEAGE TIRE COMPANY

Estimated Cost of Goods Sold

BB-4

<i>Items</i>	<i>1926</i>	<i>First Quarter</i>	<i>Second Quarter</i>	<i>Third Quarter</i>	<i>Fourth Quarter</i>
Balloon tires					
BB-4-1.	\$41,507,739	\$ 8,542,972	\$11,842,913	\$12,699,765	\$ 8,422,087
Balloon tubes					
BB-4-1.	7,073,187	1,503,224	2,058,771	2,051,372	1,459,818
To BB.	<u>\$95,664,459</u>	<u>\$18,849,906</u>	<u>\$26,323,507</u>	<u>\$30,244,018</u>	<u>\$20,247,027</u>

Analysis of Estimated Overhead Expense.—The total overhead expense is obtained from summarizing a uniform classification of expenses for each product. The overhead expense for each product is secured from a similar classification of expenses for each department. In each case the amounts which enter into the costs are secured by

the multiplication of units by prices. The summary analysis of the estimated overhead expense is shown in BB-4-1. The analysis of the overhead in the case of balloon tires and balloon tubes is shown in BB-4-1-ax. The departmental analyses and the several analyses of the remaining products are omitted here. Further details and analyses are given in the following chapter.

The standard cost of tires and of tubes is revised quarterly. It should be emphasized, however, that these changes have not been made for the purpose of trying to make the standard cost equal to the "actual" cost. The changes in costs are due to changes in methods of doing work, to fundamental changes in labor hours, wages, or both hours and wages, or other changes which affect operating standards.

THE MILEAGE TIRE COMPANY

Estimated Cost of Goods Sold

BB-4-1

	<i>1926 Total</i>	<i>First Quarter</i>	<i>Second Quarter</i>	<i>Third Quarter</i>	<i>Fourth Quarter</i>
<i>Balloon Tires</i>					
Units.....	4,499,700	902,700	1,273,500	1,389,000	934,500
Composite standard cost—per unit:					
Direct labor.....		\$1.1321	\$1.1321	\$1.1321	\$1.1321
Direct materials.....		7.3299	7.0321	6.9832	6.7823
Overhead.....		1.0018	1.1353	1.0278	1.0980
		<u>\$9.4638</u>	<u>\$9.2995</u>	<u>\$9.1431</u>	<u>\$9.0124</u>
Composite standard cost—amounts:					
Direct labor.....	\$ 5,094,110	\$1,021,946	\$ 1,441,729	\$ 1,572,486	\$1,057,947
Direct materials.....	31,609,804	6,616,700	8,955,379	9,699,664	6,338,059
Overhead.....	4,803,824	904,324	1,445,804	1,427,614	1,026,081
	<u>\$41,507,739</u>	<u>\$8,542,972</u>	<u>\$11,842,913</u>	<u>\$12,699,765</u>	<u>\$8,422,087</u>
<i>Balloon Tubes</i>					
Units.	4,749,900	965,400	1,367,500	1,403,800	1,013,200
Composite standard cost—per unit:					
Direct labor.....		\$0.1586	\$0.1586	\$0.1586	\$0.1586
Direct materials.....		1.1401	1.0602	1.0201	0.9986
Overhead.....		0.2584	0.2867	0.2826	0.2836
		<u>\$1.5571</u>	<u>\$1.5055</u>	<u>\$1.4613</u>	<u>\$1.4408</u>
Composite standard cost—amount					
Direct labor.....	\$ 753,334	\$ 153,112	\$ 216,885	\$ 222,642	\$ 160,693
Direct materials.....	4,994,273	1,100,652	1,449,823	1,432,016	1,011,781
Overhead.....	1,325,579	249,459	392,062	396,713	287,343
	<u>\$7,073,187</u>	<u>\$1,503,224</u>	<u>\$2,058,771</u>	<u>\$2,051,372</u>	<u>\$1,459,818</u>

BUDGETS OF THE MILEAGE TIRE COMPANY 389

The company does not make changes in its standard costs until the beginning of a quarter. This enables valuable comparisons to be made for management and administrative purposes.

THE MILEAGE TIRE COMPANY

Analysis of Estimated Overhead Costs

BB-4-1a

Summary	Year 1926	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
Indirect labor	\$ 2,393,701	\$ 362,825	\$ 603,030	\$ 795,542	\$ 632,294
Indirect materials	2,743,548	444,432	698,174	837,896	763,046
Indirect expenses	1,484,545	206,066	400,491	508,876	369,112
Repairs, maintenance	1,474,060	232,909	339,528	521,799	379,824
Power, light, heat and water	2,306,605	435,223	624,184	752,986	494,212
Insurance and taxes	796,839	149,398	204,358	261,804	181,279
Depreciation					
In BB-4-ca-1	4,153,442	594,357	1,184,188	1,615,474	759,423
To BB-4	\$15,352,742	\$2,425,220	\$4,053,953	\$5,294,377	\$3,579,190

THE MILEAGE TIRE COMPANY

Analysis of Estimated Overhead Cost

BB-4-1-ax

Balloon Tires

Items	1926 Total	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
Composite standard —per unit:					
Indirect labor		\$0.15230	\$0.15230	\$0.10230	\$0.15230
Indirect materials		0.19199	0.20226	0.10637	0.28212
Indirect expenses		0.04500	0.04500	0.04500	0.04050
Repairs, maintenance		0.02000	0.02000	0.02000	0.02000
Power, light, heat and water		0.21050	0.21050	0.21050	0.21050
Insurance and taxes		0.08200	0.08200	0.08200	0.08200
Depreciation		0.300001	0.423242	0.461627	0.310576
		\$1.0018	\$1.1353	\$1.0278	\$1.0980

Composite standard cost—amount:

Indirect labor	\$ 615,855	\$137,480	\$ 193,954	\$ 142,096	\$ 142,325
Indirect materials	842,284	173,317	257,577	147,748	263,642
Indirect Expenses	198,281	40,620	57,307	62,506	37,848
Repairs, maintenance	89,993	18,053	25,470	27,780	18,690
Power, light, heat and water	947,188	190,017	268,072	292,386	196,713
Insurance and taxes	368,974	74,021	104,426	113,898	76,629
Depreciation	1,741,249	270,817	538,998	641,200	290,234
	\$4,803,824	\$904,325	\$1,445,804	\$1,427,614	\$1,026,081
Units:	4,499,700	902,700	1,273,500	1,389,000	934,500

Estimated Marketing Cost at Standard Cost.—Standard marketing costs are used for the same kind of administrative and management purposes as the standard factory cost of goods sold. Marketing costs are kept in terms of the divisions of management. These divisions of management are shown in BB-5 together with a brief classification

THE MILEAGE TIRE COMPANY

Estimated Marketing Costs

BB-5

<i>Items</i>	<i>Year 1926</i>	<i>Per Unit</i>	<i>First Quarter</i>	<i>Second Quarter</i>	<i>Third Quarter</i>	<i>Fourth Quarter</i>
<i>Costs, sales manager:</i>						
Salaries.....	\$ 6,246,366	\$0 2966	\$1,227,598	\$1,655,503	\$1,969,660	\$1,393,605
Commissions.....	5,033,316	0.2390	989,197	1,334,002	1,587,152	1,122,965
Traveling.....	1,988,055	0 0944	390,712	526,903	620,892	443,548
Warehousing.....	1,769,032	0 0840	347,668	468,854	557,827	394,683
Other.....	296,944	0.0141	58,358	78,701	93,635	66,250
	<u>\$15,333,713</u>	<u>\$0.7281</u>	<u>\$3,013,533</u>	<u>\$4,063,963</u>	<u>\$4,835,166</u>	<u>\$3,421,051</u>
<i>Costs, publicity manager:</i>						
Salaries.....	\$ 448,576	\$0.0213	\$ 88,159	\$ 118,888	\$ 141,450	\$ 100,079
Advertising.....	5,224,961	0.2481	1,026,861	1,384,795	1,647,582	1,165,723
	<u>\$ 5,673,537</u>	<u>\$0.2694</u>	<u>\$1,115,020</u>	<u>\$1,503,683</u>	<u>\$1,789,032</u>	<u>\$1,265,802</u>
<i>Costs, manager of market- ing:</i>						
Salaries.....	\$ 471,742	\$0.0224	\$ 92,711	\$ 125,028	\$ 148,754	\$ 105,249
Traveling.....	157,949	0.0075	31,042	41,862	49,806	35,239
Entertainment.....	134,784	0 0064	26,489	35,722	42,501	30,072
Rentals.....	3,476,989	0.1651	683,332	921,522	1,096,396	775,739
Other.....	174,797	0.0083	34,353	46,327	55,119	38,998
	<u>\$ 4,416,261</u>	<u>\$0.2097</u>	<u>\$ 867,927</u>	<u>\$1,170,461</u>	<u>\$1,392,576</u>	<u>\$ 985,297</u>
To BB.....	<u>\$25,423,511</u>	<u>\$1.2072</u>	<u>\$4,996,480</u>	<u>\$6,738,107</u>	<u>\$8,016,774</u>	<u>\$5,672,150</u>
Estimated sales units.....	<u>21,059,900</u>		<u>4,138,900</u>	<u>5,581,600</u>	<u>6,640,800</u>	<u>4,698,600</u>

THE MILEAGE TIRE COMPANY

Estimated Other Management Costs

BB-6

<i>Items</i>	<i>Year 1926</i>	<i>Per Unit</i>	<i>First Quarter</i>	<i>Second Quarter</i>	<i>Third Quarter</i>	<i>Fourth Quarter</i>
<i>Costs:</i>						
Chief executive.....	\$ 1,756,395	\$0.0834	\$ 345,184	\$ 465,505	\$ 553,843	\$ 391,863
<i>Costs: manager of stand- ards and records</i>						
Controller.....	\$ 1,712,170	\$0 0813	336,493	453,784	539,897	381,996
Costs.....	1,111,963	0 0528	218,534	294,708	350,635	248,086
Budget.....	21,060	0.0010	4,139	5,582	6,641	4,698
Accounting.....	2,217,607	0.1053	435,826	587,742	699,276	494,763
Statistical.....	1,299,396	0.0617	255,370	344,385	409,737	289,904
	<u>\$ 6,362,196</u>	<u>\$0.3021</u>	<u>\$1,250,362</u>	<u>\$1,686,201</u>	<u>\$2,006,186</u>	<u>\$1,419,447</u>
<i>Costs: manager of person- nel</i>						
Personnel.....	\$ 5,153,357	\$0.2447	\$1,012,789	\$1,365,818	\$1,625,003	\$1,149,747
Employment.....	1,600,552	0.0760	314,556	424,202	504,700	357,094
Training.....	96,876	0.0046	19,039	25,675	30,548	21,614
	<u>\$ 6,850,785</u>	<u>\$0.3253</u>	<u>\$1,346,384</u>	<u>\$1,815,695</u>	<u>\$2,160,251</u>	<u>\$1,528,455</u>
To BB.....	<u>\$14,969,376</u>	<u>\$0 7108</u>	<u>\$2,941,930</u>	<u>\$3,967,401</u>	<u>\$4,720,280</u>	<u>\$3,339,765</u>
Units to be sold.....	<u>21,059,900</u>		<u>4,138,900</u>	<u>5,581,600</u>	<u>6,640,800</u>	<u>4,698,600</u>

of expenses. Each cost account is found by the multiplication of units by prices.

Estimated Standard for Other Management Costs.—There are other management costs than those shown above that should have standards set to control such costs. The costs for the chief executive, the manager of standards and records, and the manager of personnel are shown in BB-6. In each case the standard amount for the estimate is the product of units times prices.

THE MILEAGE TIRE COMPANY					
<i>Estimated Cost of Goods Sold—Variances</i>					BB-7
<i>Budget</i>	<i>1926 Total</i>	<i>First Quarter</i>	<i>Second Quarter</i>	<i>Third Quarter</i>	<i>Fourth Quarter</i>
Labor	\$11,903,000	\$ 2,313,000	\$ 3,234,000	\$ 3,790,000	\$ 2,566,000
Materials	69,062,406	14,305,000	19,185,406	21,330,000	14,242,000
Overhead	15,505,500	2,459,500	4,087,000	5,334,000	3,625,000
	<u>\$96,470,906</u>	<u>\$19,077,500</u>	<u>\$26,506,406</u>	<u>\$30,454,000</u>	<u>\$20,433,000</u>
<i>Standard</i>					
Labor	\$11,767,782	\$ 2,246,433	\$ 3,214,153	\$ 3,757,544	\$ 2,549,650
Materials	68,543,935	14,178,252	19,055,399	21,192,096	14,118,096
Overhead	15,352,742	2,425,219	4,053,954	5,294,377	3,579,190
	<u>\$95,664,459</u>	<u>\$18,849,906</u>	<u>\$26,323,507</u>	<u>\$30,244,018</u>	<u>\$20,247,027</u>
<i>Variances</i>					
Labor	\$ 135,217	\$ 66,566	\$ 19,846	\$ 32,455	\$ 16,349
Materials	518,470	126,747	130,006	137,903	123,813
Overhead	152,758	34,280	33,045	39,622	45,809
	<u>\$ 806,446</u>	<u>\$ 227,593</u>	<u>\$ 182,898</u>	<u>\$ 209,981</u>	<u>\$ 185,972</u>

Variances in Estimated Cost of Goods Sold.—If the profit and loss statement is to be stated at "cost," the insertion into it of costs stated in terms of standards must have compensating or offsetting items to cover the difference between standard and actual cost. The estimated amount of these compensating differences in respect to the factory cost of goods sold is shown in BB-7. The amounts as shown here are stated as labor, materials, and overhead. The items are shown also in terms of the budget, standard costs, and the variances. The amounts stated as standard costs in BB-4 agree in total with the totals shown here and prove the accuracy of the computations.

Variances in Management Expense Budget.—The total variances between the marketing expense budget and the standard cost of

such marketing expenses are shown in totals in BB-8. The reports of the company show the variances in each executive's expenses and show causes and give explanations for such variances.

The variances in other management expense budgets are shown in BB-9. The explanation given for BB-8 is applicable here. The details of the schedules are omitted.

Other Profit and Loss Items.—The budget for items listed in Exhibit BB under "other income and other deductions" is shown in considerable detail in the company's report. For the purposes of this treatise, these details are omitted. In the chapter which follows, a brief treatment of these items is given.

Many interesting and illuminating details supporting the budget have been reserved for statement in other chapters, while others must be omitted entirely, except for illustrative material.

THE MILEAGE TIRE COMPANY

Variances in Marketing Expense Budget

BB-8

<i>Organization Units</i>	<i>Total</i>	<i>First Quarter</i>	<i>Second Quarter</i>	<i>Third Quarter</i>	<i>Fourth Quarter</i>
Sales manager.....	\$ 93,713*	\$376,467	\$403,963*	\$315,166*	\$248,949
Publicity manager.....	6,463	154,980	56,317	189,032*	15,802*
Manager of marketing....	13,739	142,073	170,461*	92,576*	134,703
	<u>\$ 73,511*</u>	<u>\$673,520</u>	<u>\$518,107*</u>	<u>\$596,774*</u>	<u>\$367,850</u>

THE MILEAGE TIRE COMPANY

Variances in Other Management Expenses Budget

BB-9

<i>Organization Units</i>	<i>Total</i>	<i>First Quarter</i>	<i>Second Quarter</i>	<i>Third Quarter</i>	<i>Fourth Quarter</i>
Chief executive.....	\$ 18,605	\$ 64,816	\$ 25,505*	\$ 73,843*	\$ 53,137
Manager of standards and Records.....	122,196*	209,638	166,201*	316,186*	150,553
Manager of personnel....	59,215	243,616	125,695*	170,251*	111,545
	<u>\$ 44,376*</u>	<u>\$518,070</u>	<u>\$317,401*</u>	<u>\$560,280*</u>	<u>\$315,235</u>

* Red.

CHAPTER XXVII

MILEAGE TIRE COMPANY PERFORMANCE, AS REFLECTED IN FINANCIAL STATEMENTS

Business History.—The history of any business would be incomplete indeed without a presentation of its financial position as at specific dates and an explanation of the operations which transpired between the specific dates to change its financial position. It is the purpose of this chapter to show the financial history of the Mileage Tire Company, by quarters, for the year 1926. This history is recorded in such manner that comparison may be made not only between quarters, but also between the budget and the performance.

Pro-forma Financial History.—The comparative balance sheets of the Mileage Tire Company as at the beginning and the end of each quarter of 1926 are shown in Exhibit A. This balance sheet is set up in the same manner that the budget was set up, as shown in Exhibit AA of the preceding chapter.

The financial history of the company is presented in this chapter in "exhibit and schedule" form. The exhibits are called A, for the balance sheet, and B for the profit and loss statement. There are several schedules referred to in each exhibit. Each schedule is marked with a letter and one or more numerals and letters, and these markings serve as a basis for the description of the schedules. To illustrate: the marking A-2 denotes that the item is found in the balance sheet, and is the second item for which further analysis is desired. The schedule referred to (A-2) is the dollar value of the finished goods at standard cost. Further analysis of the data in this schedule is desired and is shown in A-2-I. This schedule is further analyzed in A-2-I-a to show the major components of the standard cost of balloon tires and balloon tubes. The overhead expense shown in A-2-I-a is analyzed in A-2-I-b.

THE MILEAGE TIRE COMPANY

Comparative Balance Sheet

EXHIBIT A

Current Assets:

Cash, U. S. government securities and debts receivable	January 1, 1926	March 31, 1926	June 30, 1926	September 30, 1926	December 31, 1926	
Cash.....	\$ 9,185,980	\$ 8,428,912	\$ 6,968,320	\$ 12,687,982	\$ 16,486,493	
Marketable U. S. securities.....	5,986,900	5,986,900	5,986,900	5,986,900	5,986,900	
Notes, loans and acceptances.....	3,895,291	2,895,895	2,911,201	3,982,864	3,198,645	
Accounts receivable..	15,974,290	9,520,952	12,026,351	17,596,468	14,879,029	
	<u>35,042,462</u>	<u>26,832,660</u>	<u>27,892,773</u>	<u>40,254,215</u>	<u>40,551,069</u>	A-1
Merchandise, materials and goods in process:						
Finished goods....	\$ 5,649,158	\$ 10,310,537	\$ 9,569,705	\$ 3,930,892	\$ 5,198,399	A-2
Goods in process..	8,531,746	8,437,642	9,003,655	7,659,047	6,306,625	A-3
Materials and supplies.....	6,509,381	7,647,447	8,496,699	6,593,083	6,479,877	A-4
Materials and supplies in transit..	4,760,891	9,104,148	7,381,562	7,557,151	5,142,048	A-5
	<u>25,451,178</u>	<u>35,499,776</u>	<u>34,451,623</u>	<u>25,740,175</u>	<u>23,126,950</u>	
Total current assets..	<u>\$ 60,493,640</u>	<u>\$ 62,332,396</u>	<u>\$ 62,344,396</u>	<u>\$ 65,994,391</u>	<u>\$ 63,678,019</u>	
Properties, plants and securities						
Land	\$ 1,211,320	\$ 1,211,320	\$ 1,211,320	\$ 1,211,320	\$ 1,211,320	
Buildings..	15,921,388	15,921,388	15,921,388	15,921,388	15,921,388	
Machinery and equipment.....	30,890,621	30,987,895	31,698,895	31,998,895	32,040,602	
Molds, cores, and poles	2,089,165	2,136,385	2,296,385	2,301,640	2,312,986	
Miscellaneous items .	167,869	168,932	168,932	170,041	174,862	
	<u>50,280,365</u>	<u>50,425,922</u>	<u>51,296,922</u>	<u>51,603,286</u>	<u>51,661,161</u>	
Less: reserve for depreciation.....	8,982,656	10,146,673	11,566,151	12,616,557	13,678,140	A-6
Net value.....	<u>\$ 41,297,709</u>	<u>\$ 40,279,248</u>	<u>\$ 39,730,771</u>	<u>\$ 38,986,729</u>	<u>\$ 37,983,020</u>	
Prepaid, deferred and misc. assets.....	1,688,921	1,021,205	987,641	1,005,200	991,884	A-7
Good will, patents, and trademarks...	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	
	<u>\$ 1,688,922</u>	<u>\$ 1,021,206</u>	<u>\$ 987,642</u>	<u>\$ 1,005,201</u>	<u>\$ 991,885</u>	
Total assets.....	<u>\$103,480,272</u>	<u>\$103,632,891</u>	<u>\$103,062,810</u>	<u>\$105,986,321</u>	<u>\$102,652,926</u>	

MILEAGE TIRE COMPANY PERFORMANCE

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THE MILEAGE TIRE COMPANY

Comparative Balance Sheet

EXHIBIT A

Liabilities

	January 1, 1926	March 31, 1926	June 30 1926	Sept. 30, 1926	Dec. 31, 1926
<i>Current Liabilities</i>					
Notes, loans and ac- ceptances payable. \$	7,985,870	\$ 10,985,670	\$ 10,142,529	\$ 9,802,192	\$ 8,606,896
Accounts payable....	4,875,895	6,013,279	6,000,321	6,213,641	3,921,627
Accrued pay roll	695,921	591,280	698,321	649,862	370,980
Accrued taxes and in- terest.....	895,401	386,450	298,675	306,983	590,380
Misc. items payable.	86,200	61,283	65,980	78,320	68,201
Provision for income taxes.....	1,895,280	298,476	180,211	80,260	334,779
	<u>\$ 16,434,568</u>	<u>\$ 18,336,440</u>	<u>\$ 17,386,039</u>	<u>\$ 17,131,261</u>	<u>\$ 13,892,865</u>

Capital, Surplus and
Reserves

Capital stock, comm.	\$ 30,000,000	\$ 30,000,000	\$ 30,000,000	\$ 30,000,000	\$ 30,000,000	
Capital stock, pfd. ..	25,504,000	25,504,000	25,504,000	25,504,000	25,504,000	
General reserves....	8,925,695	8,710,126	8,065,201	8,396,891	9,521,212	A-8
Appropriated surplus.	15,985,200	15,985,200	15,114,200	14,814,200	14,814,200	
Free surplus.....	6,630,808	5,097,124	6,993,369	10,139,968	8,920,648	A-9
	<u>\$ 87,045,703</u>	<u>\$ 85,296,450</u>	<u>\$ 85,676,770</u>	<u>\$ 88,855,060</u>	<u>\$ 88,760,060</u>	
	<u>\$103,480,272</u>	<u>\$103,632,891</u>	<u>\$103,062,810</u>	<u>\$105,986,321</u>	<u>\$102,652,926</u>	

THE MILEAGE TIRE COMPANY

Finished Goods at Standard Cost

A-2

Schedule Items	Jan. 1, 1926	March 31, 1926	June 30, 1926	Sept. 30, 1926	Dec. 31, 1926
Balloon tires, A-2-1.....	\$2,380,221	\$ 3,733,637	\$3,069,347	\$ 790,558	\$1,969,804
Balloon tubes, A-2-1.....	412,650	496,253	550,718	458,004	546,355
	<u>\$5,649,158</u>	<u>\$10,310,537</u>	<u>\$9,569,705</u>	<u>\$3,930,892</u>	<u>\$5,198,399</u>

THE MILEAGE TIRE COMPANY

Analysis of Finished Goods at Standard Costs

A-2-1

Balloon Casings, 1926

	Units	Prices	Amount	Amount	Prices	Units	
Initial inventory .	251,508	\$9.4638	\$ 2,380,221	\$ 8,549,861	\$9.4638	903,428	Sales
Finished goods . .	1,053,408	9.4638	9,969,242	3,733,637	9.2995	401,488	Inventory
				65,964			Price adjust- ment
First quarter . .	1,304,916		\$12,349,464	\$12,349,464		1,304,916	
Initial inventory .	401,488	9.2995	\$ 3,733,637	11,778,821	9.2995	1,266,608	Sales
Finished goods . .	1,200,821	9.2995	11,167,034	3,069,347	9.1431	335,701	Inventory
				52,503			Price adjust- ment
Second quarter .	1,602,309		\$14,900,672	\$14,900,672		1,602,309	
Initial inventory .	335,701	9.1431	\$ 3,069,347	\$12,796,545	9.1431	1,399,585	Sales
Finished goods . .	1,151,603	9.1431	10,529,221	790,558	9.0124	87,719	Inventory
				11,464			Price adjust- ment
Third quarter . .	1,487,304		\$13,598,569	\$13,598,569		1,487,304	
Initial inventory .	87,719	9.0124	\$ 790,558	\$ 8,508,192	9.0124	944,054	Sales
Finished goods . .	1,074,901	9.0124	9,687,437	1,969,804	9.0124	218,566	Inventory
Fourth quarter .	1,162,620		\$10,477,996	\$10,477,996		1,162,620	

THE MILEAGE TIRE COMPANY

Analysis of Cost of Finished Goods—Standard Cost

A-2-1-a

Balloon Tires	Total	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
Units		401,488	335,701	87,719	218,566
Composite standard					
Cost per unit:					
Direct labor		\$1.1321	\$1.1321	\$1.1321	\$1.1321
Direct materials		7.0321	6.9832	6.7823	6.7823
Overhead		1.1353	1.0278	1.0980	1.0980
		\$9.2995	\$9.1431	\$9.0124	\$9.0124
Composite standard cost-amount					
Direct labor	\$1,181,316	\$ 454,524	\$ 380,047	\$ 99,306	\$ 247,438
Direct materials	7,244,887	2,823,303	2,344,267	594,936	1,428,380
Overhead	1,137,143	455,809	345,033	96,315	239,985
	\$9,563,348	\$3,733,637	\$3,069,347	\$700,558	\$1,969,804

MILEAGE TIRE COMPANY PERFORMANCE

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THE MILEAGE TIRE COMPANY

Analysis of Overhead Costs in Finished Goods

A-2-1-b

Summary	1926	First Quarter Amount	Second Quarter Amount	Third Quarter Amount	Fourth Quarter Amount
Indirect labor.....	\$ 838,797	\$ 249,691	\$ 279,212	\$139,165	\$170,727
Indirect materials.....	926,808	283,037	294,615	150,604	198,551
Indirect expenses.....	543,836	173,730	179,663	86,983	103,458
Repairs, maintenance...	550,567	160,173	196,400	91,241	102,751
Power, light, heat, and water.....	717,392	251,105	244,757	93,579	127,950
Insurance and taxes....	245,772	77,612	84,297	37,752	46,109
Depreciation.....	1,308,839	442,509	509,769	160,967	195,592
	<u>\$5,132,015</u>	<u>\$1,637,860</u>	<u>\$1,788,717</u>	<u>\$760,294</u>	<u>\$945,142</u>

THE MILEAGE TIRE COMPANY

Analysis of Overhead Costs in Finished Goods

A-2-1-bx

<i>Balloon Tires:</i>		First	Second	Third	Fourth
Composite overhead	Year	Quarter	Quarter	Quarter	Quarter
—amount:	1926	Amount	Amount	Amount	Amount
Indirect labor.....	\$ 142,136	\$ 61,146	\$ 34,342	\$13,359	\$ 33,287
Indirect materials.....	203,318	81,200	35,708	24,747	61,661
Indirect expense.....	45,578	18,066	15,106	3,552	8,851
Repairs, maintenance.....	20,869	8,029	6,714	1,754	4,371
Power, light, heat and water.	219,651	84,513	70,665	18,464	46,008
Insurance and taxes.....	85,564	32,922	27,527	7,192	17,922
Depreciation.....	420,025	169,929	154,969	27,243	67,882
To A-2-1-a.....	<u>\$1,137,143</u>	<u>\$455,809</u>	<u>\$345,033</u>	<u>\$96,315</u>	<u>\$239,985</u>
Composite overhead—					
per unit:					
Units.....		401,488	335,701	87,719	218,566
Indirect labor.....		\$0.15230	\$0.10230	\$0.15230	\$0.15230
Indirect materials.....		0.20225	0.10637	0.28212	0.28212
Indirect expense.....		0.04500	0.04500	0.04050	0.04050
Repairs, maintenance.....		0.02000	0.02000	0.02000	0.02000
Power, light, heat and water.		0.21050	0.21050	0.21050	0.21050
Insurance and taxes.....		0.08200	0.08200	0.08200	0.08200
Depreciation.....		0.42325	0.46163	0.31058	0.31058
		<u>\$1.13530</u>	<u>\$1.02780</u>	<u>\$1.09800</u>	<u>\$1.09800</u>

THE MILEAGE TIRE COMPANY

Goods in Process

A-3

<i>Items</i>	1926				
	<i>Jan. 1, 1926</i>	<i>First Quarter</i>	<i>Second Quarter</i>	<i>Third Quarter</i>	<i>Fourth Quarter</i>
Balloon tires (A-3-1).....	\$3,718,754	\$3,100,763	\$3,771,735	\$3,418,765	\$2,962,927
Balloon tubes (A-3-1).....	743,573	685,875	616,128	638,209	533,167
Sub-total	<u>\$7,057,844</u>	<u>\$6,623,934</u>	<u>\$7,077,619</u>	<u>\$6,091,583</u>	<u>\$4,866,953</u>
Plystock in store (A-3-2).....	\$ 980,365	\$1,210,230	\$1,230,321	\$ 936,280	\$ 931,232
Gummed rubber (A-3-2).....	421,236	521,611	601,232	546,221	438,280
Cement rubber (A-3-2).....	32,835	35,980	41,221	32,620	30,840
Compounded					
Batches (A-3-2).....	10,890	12,638	14,896	12,320	10,212
Mixed and milled rubber (A-3-2).....	13,284	15,865	19,262	20,120	14,210
Calendar stocks (A-3-2).....	15,290	17,382	19,101	19,892	14,895
Sub-total.....	<u>\$1,473,902</u>	<u>\$1,813,708</u>	<u>\$1,926,035</u>	<u>\$1,567,463</u>	<u>\$1,439,671</u>
To A.....	<u>\$8,531,746</u>	<u>\$8,437,642</u>	<u>\$9,003,655</u>	<u>\$7,659,047</u>	<u>\$6,306,625</u>

THE MILEAGE TIRE COMPANY

Analysis of Goods In Process

A-3-1

<i>Balloon Casings, 1926</i>							
<i>Items</i>	<i>Units</i>	<i>Prices</i>	<i>Amount</i>	<i>Amount</i>	<i>Prices</i>	<i>Units</i>	<i>Items</i>
Initial inventory..	\$ 392,605	\$9.4720	\$ 3,718,754	\$ 9,969,242	\$9.4638	1,053,408	Finished
Processed.....	992,400	9.4239	9,351,251	3,100,763	9.3510	331,597	Inventory
First quarter....	1,385,005		<u>\$13,070,006</u>	<u>\$13,070,006</u>		1,385,005	
Initial inventory..	331,597	9.3510	3,100,763	\$11,167,034	9.2995	1,200,821	Finished
Processed.....	1,280,305	9.2462	11,838,006	3,771,735	9.1732	411,169	Inventory
Second quarter..	1,611,902		<u>\$14,938,770</u>	<u>\$14,938,770</u>		1,611,902	
Initial inventory..	411,169	9.1732	\$ 3,771,735	\$10,529,221	9.1431	1,151,603	Finished
Processed.....	1,120,326	9.0833	10,176,250	3,418,765	8.9993	379,892	Inventory
Third quarter... 1,531,495			<u>\$13,947,986</u>	<u>\$13,947,986</u>		1,531,495	
Initial inventory..	379,892	8.9993	\$ 3,418,765	\$ 9,687,437	9.0124	1,074,901	Finished
Processed.....	1,025,608	9.0011	9,231,600	2,962,927	8.9623	330,599	Inventory
Fourth quarter.. 1,405,500			<u>\$12,650,365</u>	<u>\$12,650,365</u>		1,405,500	

MILEAGE TIRE COMPANY PERFORMANCE

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THE MILEAGE TIRE COMPANY

Analysis of Cost of Goods in Process

A-3-1-a

<i>Balloon Tires</i>	<i>Total</i>	<i>First Quarter</i>	<i>Second Quarter</i>	<i>Third Quarter</i>	<i>Fourth Quarter</i>
Units.....		352,993	431,727	403,885	351,662
Composite standard					
Cost per unit:					
Direct labor.....		\$ 0.8700	\$ 0.8900	\$ 0.8123	\$ 0.7832
Direct materials.....		7.0321	6.9832	6.7823	6.7823
Overhead.....		0.8821	0.8632	0.8701	0.8600
		<u>\$ 8.7842</u>	<u>\$ 8.7364</u>	<u>\$ 8.4647</u>	<u>\$ 8.4255</u>
Composite standard					
Cost—amount:					
Direct labor.....	\$ 1,294,838	\$ 307,103	\$ 384,237	\$ 328,075	\$ 275,421
Direct materials.....	10,621,461	2,482,284	3,041,831	2,739,268	2,385,076
Overhead.....	1,337,891	311,375	372,666	351,420	302,429
	<u>\$13,254,191</u>	<u>\$3,100,763</u>	<u>\$3,771,735</u>	<u>\$3,418,765</u>	<u>\$2,962,927</u>

THE MILEAGE TIRE COMPANY

Analysis of Overhead Cost of Goods in Process

A-3-1-b

<i>Summary</i>	<i>1926 Proof</i>	<i>First Quarter Amount</i>	<i>Second Quarter Amount</i>	<i>Third Quarter Amount</i>	<i>Fourth Quarter Amount</i>
Indirect labor.....	\$ 424,128	\$103,302	\$106,728	\$119,846	\$ 94,251
Indirect materials.....	523,412	119,692	109,697	163,919	130,102
Indirect expense.....	234,432	61,318	67,476	61,470	44,166
Repairs, maintenance.....	201,514	54,355	60,793	50,753	35,612
Power, light, heat, and water.	444,736	112,057	128,428	112,649	91,602
Insurance and taxes.....	164,862	37,418	48,537	43,446	35,458
Depreciation.....	779,748	241,842	280,636	143,294	113,975
	<u>\$2,772,834</u>	<u>\$729,987</u>	<u>\$802,298</u>	<u>\$695,379</u>	<u>\$545,169</u>

ACCOUNTING FOR EXECUTIVE CONTROL

THE MILEAGE TIRE COMPANY

Analysis of Overhead Cost of Goods in Process A-3-1-b (Continued)

	1926	First	Second	Third	Fourth
<i>Balloon Tires</i>	<i>Total</i>	<i>Quarter</i>	<i>Quarter</i>	<i>Quarter</i>	<i>Quarter</i>
		<i>Amount</i>	<i>Amount</i>	<i>Amount</i>	<i>Amount</i>
Units.....		352,993	431,727	403,885	351,662
Composite standard cost per unit:					
Direct labor.....		\$0.1106	\$0.0902	\$0.1373	\$0.1346
Direct materials.....		0.1482	0.0843	0.2485	0.2427
Direct expense.....		0.0321	0.0342	0.0353	0.0332
Repairs, maintenance.....		0.0162	0.0183	0.0165	0.0162
Power, light, heat, and water.		0.1634	0.1806	0.1847	0.1832
Insurance and taxes.....		0.0621	0.0723	0.0742	0.0724
Depreciation.....		0.3495	0.3833	0.1736	0.1777
		<u>\$0.8821</u>	<u>\$0.8632</u>	<u>0.8701</u>	<u>\$0.8600</u>
Composite standard cost—amount.....					
Indirect labor.....	\$180,769	\$39,041	\$38,941	\$55,453	\$47,333
Indirect materials.....	274,421	52,313	36,394	100,365	85,348
Indirect expense.....	52,028	11,331	14,765	14,257	11,675
Repairs, maintenance.....	25,980	5,718	7,900	6,664	5,696
Power, light, heat, and water	274,671	57,679	77,969	74,597	64,424
Insurance and taxes.....	108,564	21,920	31,213	29,969	25,460
Depreciation.....	421,455	123,371	165,480	70,113	62,490
	<u>\$1,337,891</u>	<u>\$311,375</u>	<u>\$372,666</u>	<u>\$351,420</u>	<u>\$302,429</u>

THE MILEAGE TIRE COMPANY

Standard Costs of Goods in Process

A-3-2

<i>First Quarter</i>	<i>Total</i>	<i>Labor</i>	<i>Materials</i>	<i>Overhead</i>
Plystock.....	\$1,210,230	\$90,211	\$1,034,807	\$85,211
Gummed rubber.....	521,611	18,640	487,322	15,648
Cement rubber.....	35,980	2,162	32,296	1,521
Compounded batches.....	12,638	496	11,815	326
Mixed and milled rubber.....	15,865	3,620	6,054	6,190
Calendar stocks.....	17,382	1,895	11,891	3,595
	<u>\$1,813,708</u>	<u>\$117,025</u>	<u>\$1,584,188</u>	<u>\$112,494</u>

MILEAGE TIRE COMPANY PERFORMANCE

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THE MILEAGE TIRE COMPANY
Analysis of Overhead Cost of Goods in Process

A-3-2-a

	First Quarter Amount	Second Quarter Amount	Third Quarter Amount	Fourth Quarter Amount
<i>Summary</i>				
Indirect labor.....	\$ 22,363	\$ 22,730	\$20,023	\$18,271
Indirect materials.....	46,429	48,721	38,935	35,527
Indirect expenses.....	13,845	13,962	11,866	10,827
Repairs, maintenance.....	5,624	5,820	4,820	4,398
Power, light, heat and water.....	11,249	11,475	9,270	8,458
Insurance and taxes.....	865	890	741	676
Depreciation.....	12,116	13,430	10,790	10,150
	<u>\$112,494</u>	<u>\$117,031</u>	<u>\$96,448</u>	<u>\$88,311</u>

Playload in Store

Composite standard cost—per unit:

Indirect labor.....	\$0.0020	\$0.0020	\$0.0020	\$0.0020
Indirect materials.....	0.0082	0.0079	0.0071	0.0061
Indirect expense.....	0.0032	0.0032	0.0032	0.0032
Repairs, maintenance.....	0.0011	0.0011	0.0011	0.0011
Power, light, heat, and water.....	0.0022	0.0022	0.0022	0.0022
Insurance and Taxes.....	0.0001	0.0001	0.0001	0.0001
Depreciation.....	0.0033	0.0033	0.0033	0.0033
	<u>\$0.0201</u>	<u>\$0.0198</u>	<u>\$0.0190</u>	<u>\$0.0180</u>
	<u>4,651,154</u>	<u>6,827,532</u>	<u>7,196,621</u>	<u>7,157,819</u>

THE MILEAGE TIRE COMPANY

Materials and Supplies

A-4

<i>Items</i>	Jan. 1, 1926	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
Crude rubber.....	\$5,285,165	\$6,189,230	\$6,895,211	\$5,121,895	\$5,198,360
Textiles.....	1,002,321	1,111,321	1,213,626	1,132,891	995,896
Other materials....	221,895	346,895	387,862	338,296	285,620
	<u>\$6,509,381</u>	<u>\$7,647,447</u>	<u>\$8,496,699</u>	<u>\$6,593,083</u>	<u>\$6,479,877</u>

THE MILEAGE TIRE COMPANY

Materials and Supplies in Transit

A-5

<i>Items</i>	Jan. 1, 1926	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
Crude rubber.....	\$4,623,895	\$8,895,341	\$7,185,386	\$7,380,960	\$4,985,876
Textiles.....	104,896	180,206	163,280	145,890	120,980
Other materials....	32,100	28,600	32,895	30,300	35,190
	<u>\$4,760,891</u>	<u>\$9,104,148</u>	<u>\$7,381,562</u>	<u>\$7,557,151</u>	<u>\$5,142,048</u>

THE MILEAGE TIRE COMPANY

Reserve for Depreciation

A-6

Reserve for depreciation, January 1, 1926	\$ 8,982,656	
Depreciation in cost of goods sold (B-4-I-a)	592,009	
Depreciation in idle plant facilities (B-II-1)	254,114	
Depreciation, used capacity—non-manufacturing	54,339	
Depreciation, idle capacity—non-manufacturing	24,303	
Depreciation in inventories, increase (A-I4-I)	239,251	

Reserve for depreciation, March 31, 1926	\$10,146,673	
Depreciation in cost of goods sold (B-4-I-a)	1,178,923	
Depreciation, idle plant facilities	26,572	
Depreciation, used capacity—non-manufacturing	99,341	
Depreciation, idle capacity—non-manufacturing	7,270	
Depreciation in inventories, increase (A-I4-I)	107,368	

Reserve for depreciation, June 30, 1926	\$11,566,151	
Depreciation in cost of goods sold (B-4-I-a)	1,621,929	
Depreciation, used capacity—non-manufacturing	143,823	

\$13,331,904

Depreciation idle plant facilities	\$210,303	
Depreciation, idle facilities—non-manufacturing	16,260	
Depreciation in inventories, decrease	488,784	715,347

Reserve for depreciation, September 30, 1926	\$12,616,557	
Depreciation in cost of goods sold	762,471	
Depreciation, idle plant facilities	204,043	
Depreciation, used capacity—non-manufacturing	72,113	
Depreciation, idle capacity—non-manufacturing	18,288	
Depreciation in inventories, increase	4,669	

Reserve for depreciation, December 31, 1926	\$13,678,140	
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Summary

Reserve for depreciation, January 1, 1926 (A)	\$8,982,656	
Less: depreciation in inventory, January 1, 1926	457,217	

\$8,525,439

Depreciation in cost of goods sold (B-4-I-a)	4,155,334	
Depreciation in idle plant facilities (B-II-1)	274,427	
Depreciation, used capacity—non-manufacturing (B-II-2)	369,618	
Depreciation, idle capacity—non-manufacturing (B-II-2)	33,601	
Depreciation in inventories	319,718	\$13,678,140

MILEAGE TIRE COMPANY PERFORMANCE

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THE MILEAGE TIRE COMPANY

Variations in Finished and In-Process Goods

A-7

Items	Schedule	Mar. 31, 1926	June 30, 1926	Sept. 30, 1926	Dec. 31, 1926
Finished goods.....	A-7-1	\$ 202,820	\$ 97,854	\$ 31,295	\$ 83,073
Tires and tubes in process.....	A-7-2	174,263	142,801	138,073	105,999
Goods in process.....	A-7-3	82,172	31,933	8,019	21,032
		<u>\$ 459,256</u>	<u>\$227,589</u>	<u>\$ 177,388</u>	<u>\$210,105</u>
Other items (the details of which are not given here.).....		561,948	715,052	827,811	781,779
To A.....		<u>\$1,021,205</u>	<u>\$987,641</u>	<u>\$1,005,200</u>	<u>\$991,884</u>

THE MILEAGE TIRE COMPANY

Analysis of Variations in Finished Goods

A-7-1

	March 31, 1926	June 30, 1926	Sept. 30, 1926	Dec. 31, 1926
<i>Actual Cost of:</i>				
Labor.....	\$ 1,299,014	\$1,218,784	\$ 517,221	\$ 658,237
Materials.....	7,536,397	6,631,653	2,673,567	3,653,610
Overhead.....	1,677,946	1,817,122	771,399	969,624
	<u>\$10,513,358</u>	<u>\$9,667,559</u>	<u>\$3,962,188</u>	<u>\$5,281,472</u>
<i>Standard cost of:</i>				
Labor.....	\$ 1,264,987	\$1,200,148	\$ 511,424	\$ 648,886
Materials.....	7,407,689	6,580,839	2,659,173	3,604,370
Overhead.....	1,637,860	1,788,717	760,294	945,142
In A-2.....	<u>\$10,310,537</u>	<u>\$9,569,705</u>	<u>\$3,930,892</u>	<u>\$5,198,399</u>
<i>Variations in:</i>				
Labor.....	\$ 34,026	\$18,635	\$ 5,797	\$ 9,351
Materials.....	128,708	50,813	14,394	49,240
Overhead.....	40,085	28,404	11,104	24,481
To A-7.....	<u>\$202,820</u>	<u>\$97,854</u>	<u>\$31,295</u>	<u>\$83,073</u>

ACCOUNTING FOR EXECUTIVE CONTROL

THE MILEAGE TIRE COMPANY

Analysis of Variations in Tires and Tubes in Process

A-7-2

	March 31, 1926	June 30, 1926	Sept. 30, 1926	Dec. 31, 1926
<i>Actual cost of:</i>				
Labor.....	\$ 653,398	\$ 718,287	\$ 596,145	\$ 466,787
Materials.....	5,379,748	5,682,454	4,928,676	3,925,319
Overhead.....	765,050	819,680	704,834	580,846
	<u>\$6,798,197</u>	<u>\$7,220,421</u>	<u>\$6,229,657</u>	<u>\$4,972,953</u>
<i>Standard cost of:</i>				
Labor.....	\$ 642,083	\$ 710,792	\$ 590,872	\$ 456,622
Materials.....	5,251,863	5,564,529	4,805,331	3,865,162
Overhead.....	729,987	802,298	695,379	545,169
In A-2.....	<u>\$6,623,934</u>	<u>\$7,077,620</u>	<u>\$6,091,583</u>	<u>\$4,866,953</u>
<i>Variations in:</i>				
Labor.....	\$ 11,315	\$ 7,494	\$ 5,273	\$ 10,165
Materials.....	127,884	117,924	123,345	60,156
Overhead.....	35,063	17,382	9,454	35,677
To A-7.....	<u>\$174,263</u>	<u>\$142,801</u>	<u>\$138,073</u>	<u>\$105,999</u>

THE MILEAGE TIRE COMPANY

Variations in Goods in Process

A-7-3

	March 31, 1926	June 30, 1926	Sept. 30, 1926	Dec. 31, 1926
<i>Actual cost of:</i>				
Labor.....	\$ 129,006	\$ 129,452	\$ 103,105	\$ 109,425
Materials.....	1,649,503	1,706,567	1,374,570	1,259,429
Overhead.....	117,370	121,949	97,807	91,849
	<u>\$1,895,880</u>	<u>\$1,957,969</u>	<u>\$1,575,482</u>	<u>\$1,460,704</u>
<i>Standard cost of:</i>				
Labor.....	\$ 117,025	\$ 120,374	\$ 99,397	\$ 95,642
Materials.....	1,584,188	1,688,630	1,371,617	1,255,717
Overhead.....	112,494	117,031	96,448	88,311
In A-2.....	<u>\$1,813,708</u>	<u>\$1,926,035</u>	<u>\$1,567,463</u>	<u>\$1,439,671</u>
<i>Variations in:</i>				
Labor.....	\$11,981	\$ 9,078	\$3,707	\$13,783
Materials.....	65,315	17,937	2,953	3,711
Overhead.....	4,876	4,917	1,358	3,538
To A-7.....	<u>\$82,172</u>	<u>\$31,933</u>	<u>\$8,019</u>	<u>\$21,032</u>

MILEAGE TIRE COMPANY PERFORMANCE

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THE MILEAGE TIRE COMPANY

General Reserves

A-8

Items	Jan. 1, 1926	March 31, 1926	June 30, 1926	Sept. 30, 1926	Dec. 31, 1926
Reserve for fluctuation in the price of crude rubber.....	\$2,000,000	\$2,000,000	\$2,000,000	\$2,000,000	\$2,000,000
Reserve for federal income taxes.....	3,169,000	2,826,940	3,046,862	2,986,365	3,910,442
Reserve for uninsured risks.....	2,162,169	2,204,962	2,411,386	2,641,893	2,786,982
Other reserves.....	1,594,525	688,223	606,952	768,632	823,787
To A.....	\$8,925,695	\$7,710,126	\$8,065,201	\$8,396,891	\$9,521,212

THE MILEAGE TIRE COMPANY

Analysis of Free Surplus

A-9

Balance January 1, 1926.....	\$ 6,630,808	
Loss for quarter ended March 31, 1926.....	487,364	\$ 6,143,444
Dividends paid 7%, preferred stock.....	\$ 446,320	
Dividends paid 2% Q., common stock.....	600,000	\$ 1,046,320
Free surplus, March 31, 1926.....	\$ 5,097,124	
Profit for quarter ended June 30, 1926.....	3,392,564	\$ 8,489,689
Dividends paid 7%, preferred stock.....	\$ 446,320	
Dividends paid 2% Q., common stock.....	600,000	
Transferred to general reserve.....	450,000	\$ 1,496,320
Free surplus, June 30, 1926.....	\$ 6,993,369	
Profit for quarter ended Sept. 30, 1926.....	4,992,919	\$11,986,288
Dividends paid 7%, preferred stock.....	\$ 446,320	
Dividends paid 2% Q., common stock.....	600,000	
Transferred to general reserve.....	800,000	\$ 1,846,320
Free surplus, September 30, 1926.....	\$10,139,968	
Profit for quarter ended December 31, 1926.....	1,027,988	\$11,167,957
Dividends paid 7%, preferred stock.....	\$ 446,320	
Dividends paid 2% Q., common stock.....	600,000	
Transferred to general reserve.....	1,200,989	\$ 2,247,309
Free surplus, December 31, 1926.....		\$ 8,920,648

ACCOUNTING FOR EXECUTIVE CONTROL

THE MILEAGE TIRE COMPANY

Profit and Loss Statement for 1926 by Quarters

EXHIBIT B

		<i>Year</i> <i>1926</i>	<i>First</i> <i>Quarter</i> <i>Amount</i>	<i>Second</i> <i>Quarter</i> <i>Amount</i>	<i>Third</i> <i>Quarter</i> <i>Amount</i>	<i>Fourth</i> <i>Quarter</i> <i>Amount</i>
Gross sales.....	B-1	\$157,130,349	\$30,298,582	\$42,762,743	\$50,186,772	\$33,882,250
Less sales returns.....	B-2	170,984	24,375	66,576	52,454	27,579
Net sales.....	B-2	\$156,959,364	\$30,274,207	\$42,696,167	\$50,134,318	\$33,854,671
Deductions from sales.....	B-3	11,539,810	2,311,109	3,136,568	3,643,379	2,448,752
Net sales.....		\$145,419,554	\$27,963,097	\$39,559,598	\$46,490,939	\$31,405,918
Cost of sales.....	B-4	95,643,056	18,776,298	26,197,277	30,360,992	20,308,489
Gross profit.....		\$ 49,776,497	\$ 9,186,799	\$13,362,321	\$16,129,947	\$11,097,429
Marketing costs.....	B-5	\$ 25,418,680	\$ 4,957,556	\$ 6,720,772	\$ 8,041,496	\$ 5,698,855
Management cost.....	B-6	14,966,532	2,919,011	3,957,194	4,734,837	3,355,489
		\$ 40,385,212	\$ 7,876,568	\$10,677,966	\$12,776,333	\$ 9,054,344
Standard operating profit.....		\$ 9,391,285	\$ 1,310,231	\$ 2,684,355	\$ 3,353,614	\$ 2,043,084
Variations from standard in:						
Cost of goods sold.....	B-7	\$ 1,124,880*	\$ 537,115*	\$ 316,645	\$ 128,056	\$ 399,175*
Marketing expenses ..	B-8	7,350	786,015*	527,424	643,940	377,997*
Management expenses ..	B-9	48,605*	592,172*	291,390	557,305	305,127*
		\$ 1,166,135*	\$ 1,915,304*	\$ 502,169	\$ 1,329,301	\$1,082,301*
Net profit from operation.....		\$ 8,225,150	\$ 605,073*	\$ 3,186,524	\$ 4,682,915	\$ 960,783
Other income.....		\$ 8,368,448	\$ 1,457,894	\$ 2,186,279	\$ 2,735,324	\$ 1,988,949
Other deductions.....	B-10	7,667,489	1,340,185	1,980,240	2,425,320	1,921,744
Net increase.....		\$ 700,958	\$ 117,709	\$ 206,039	\$ 310,003	\$ 67,205
Net income for the period.....		\$ 8,926,108	\$ 487,364*	\$ 3,392,564	\$ 4,992,919	\$1,027,988

*Red.

THE MILEAGE TIRE COMPANY

Gross Sales—

B-1

	<i>Year</i> <i>1926</i>	<i>First</i> <i>Quarter</i>	<i>Second</i> <i>Quarter</i>	<i>Third</i> <i>Quarter</i>	<i>Fourth</i> <i>Quarter</i>
Cord Tires.....	\$ 60,185,278	\$10,824,201	\$15,872,494	\$20,247,723	\$13,240,859
Fabric tires.....	2,917,682	489,333	1,018,568	811,193	598,587
High pressure tubes..	15,048,454	3,047,728	3,577,788	4,860,843	3,562,093
Balloon tires.....	66,671,755	13,405,485	18,757,524	20,624,346	13,884,398
Balloon tubes.....	12,307,179	2,531,832	3,536,368	3,642,665	2,596,311
To B.....	\$157,130,349	\$30,298,582	\$42,762,743	\$50,186,772	\$33,882,250

MILEAGE TIRE COMPANY PERFORMANCE

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THE MILEAGE TIRE COMPANY

Balloon Casings—Gross Sales

B-1-c

	1926	Units		Prices	Amount
1st quarter.....		903,726		\$14.8335	\$13,405,485
2nd quarter.....		1,269,734		14.7728	18,757,524
3rd quarter.....		1,400,806		14.7232	20,624,346
4th quarter.....		944,382		14.7021	13,884,398
		<u>4,518,648</u>			<u>\$66,671,755</u>

Sizes	Units	First Quarter			Units	Second Quarter		
		%	Prices	Amounts		%	Prices	Amounts
27x4.40-19".....	36,330	4.02	\$ 9.50	\$ 345,135	52,313	4.12	\$ 9.40	\$ 491,742
29x4.40-21".....	55,850	6.18	10.10	564,085	78,470	6.18	10.00	784,700
.....
31x6.00-19".....	16,267	1.80	19.90	323,713	22,220	1.75	20.00	444,400
32x6.00-20".....	10,755	1.19	20.30	218,326	17,903	1.41	20.25	362,535
	<u>903,726</u>	<u>100.00</u>		<u>\$13,405,485</u>	<u>1269,734</u>	<u>100.00</u>		<u>\$18,757,524</u>

THE MILEAGE TIRE COMPANY

Balloon Tubes—Gross Sales

B-1-d

	1926	Units		Prices	Amounts
1st quarter.....		962,726		\$2.6298	\$ 2,531,832
2nd quarter.....		1,369,870		2.5815	3,536,368
3rd quarter.....		1,427,321		2.5521	3,642,665
4th quarter.....		1,029,792		2.5212	2,596,311
		<u>4,789,709</u>			<u>\$12,307,179</u>

Sizes	Units	%	Prices	Amounts	Units	%	Prices	Amounts
27x4.40-19".....	39,087	4.06	\$ 1.75	\$ 68,402	56,165	4.10	\$ 1.70	\$ 95,480
29x4.40-21".....	59,689	6.20	1.85	110,424	85,069	6.21	1.85	157,377
.....
	<u>962,726</u>	<u>100.00</u>		<u>\$ 2,531,832</u>	<u>1369,870</u>	<u>100.00</u>		<u>\$ 3,536,368</u>

THE MILEAGE TIRE COMPANY

Sales Returns

B-2

Items	1926	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
.....
Balloon tires—B-2-1.....	\$ 71,179	\$ 4,235	\$44,960	\$17,352	\$ 4,631
Balloon tubes—B-2-1.....	11,274	2,023	3,141	3,666	2,443
To B.....	<u>\$170,984</u>	<u>\$24,375</u>	<u>\$66,576</u>	<u>\$52,454</u>	<u>\$27,579</u>

ACCOUNTING FOR EXECUTIVE CONTROL

THE MILEAGE TIRE COMPANY

Sales Returns—

B-2-1

	Balloon Tires			Balloon Tubes		
	Units	Prices	Amounts	Units	Prices	Amounts
1st quarter.....	936	\$2.1621	\$ 2,023.73	298	\$14.2121	\$ 4,235 20
2nd quarter.....	1,310	2.3980	3,141.38	3,126	14.3826	44,960 00
3rd quarter.....	1,527	2.4012	3,666.63	1,221	14.2120	17,352 85
4th quarter.....	1,005	2.4310	2,443.16	328	14.1213	4,631.79
To B-2.....	4,778		\$11,274.90	4,973		\$71,179.84

THE MILEAGE TIRE COMPANY

Deductions from Sales

B-3

Items	Year 1926	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
Balloon tires.....	\$ 5,485,684	\$1,166,277	\$1,519,359	\$1,672,634	\$1,127,413
Balloon tubes.....	998,575	205,331	287,153	295,529	210,560
To B.....	\$11,539,810	\$2,311,109	\$3,136,568	\$3,643,379	\$2,448,752

THE MILEAGE TIRE COMPANY

Standard Cost in Goods Sold

B-4

First Quarter, 1926	Labor	Materials	Overhead	Total
Cord tires.....	\$ 844,415	\$ 4,812,113	\$ 950,793	\$ 6,607,323
Fabric tires.....	45,892	196,300	46,441	288,635
High pressure tubes....	172,457	1,397,199	263,217	1,832,874
Balloon tires..... B-4-1	1,022,770	6,621,102	905,988	8,549,861
Balloon tubes.....	152,539	1,096,544	248,518	1,497,603
To B.....	\$2,238,076	\$14,123,262	\$2,414,959	\$18,776,298

MILEAGE TIRE COMPANY PERFORMANCE

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THE MILEAGE TIRE COMPANY

		<i>Cost of Goods Sold</i>				B-4-1
	1926	<i>First</i>	<i>Second</i>	<i>Third</i>	<i>Fourth</i>	
<i>Balloon Tires</i>	<i>Total</i>	<i>Quarter</i>	<i>Quarter</i>	<i>Quarter</i>	<i>Quarter</i>	
		<i>Amount</i>	<i>Amount</i>	<i>Amount</i>	<i>Amount</i>	
Units.....	4,513,675	903,428	1,266,608	1,399,585	944,054	
Composite stand- ard Cost—per unit:						
Labor.....		\$1.1321	\$1.1321	\$1.1321	\$1.1321	
Materials.....		7.3299	7.0321	6.9832	6.7823	
Overhead.....		1.0018	1.1353	1.0278	1.0980	
		<u>\$9.4638</u>	<u>\$9.2995</u>	<u>\$9.1431</u>	<u>\$9.0124</u>	
Composite stand- ard Cost—Amount:						
Labor.....	\$ 5,109,931	\$1,022,770	\$ 1,433,926	\$ 1,584,470	\$1,068,763	
Materials....	31,704,456	6,621,102	8,906,914	9,773,581	6,402,857	
Overhead....	4,819,032	905,988	1,437,980	1,438,493	1,036,571	
	<u>\$41,633,420</u>	<u>\$8,549,861</u>	<u>\$11,778,821</u>	<u>\$12,796,545</u>	<u>\$8,508,192</u>	

ACCOUNTING FOR EXECUTIVE CONTROL

THE MILEAGE TIRE COMPANY

Analysis of Overhead Costs

B-4-1-a

<i>Summary</i>	<i>First Quarter Amount</i>	<i>Second Quarter Amount</i>	<i>Third Quarter Amount</i>	<i>Fourth Quarter Amount</i>
Indirect labor.....	\$ 361,143	\$ 600,230	\$ 797,488	\$ 632,386
Indirect materials.....	443,165	694,950	839,447	764,185
Indirect expenses.....	204,949	398,928	510,366	368,426
Repairs, maintenance.....	231,284	337,770	522,206	378,140
Power, light, heat, and water.....	433,567	620,963	755,638	495,121
Insurance and taxes.....	148,847	203,242	262,844	181,707
Depreciation.....	592,009	1,178,923	1,621,929	762,471
	<u>\$2,414,959</u>	<u>\$4,035,010</u>	<u>\$5,309,921</u>	<u>\$3,582,439</u>
Units.....	<u>4,106,657</u>	<u>5,367,240</u>	<u>6,661,279</u>	<u>4,720,722</u>

*Balloon Tires*Composite standard cost—per
unit:

Units	903,428	1,266,608	1,399,585	944,054
Indirect labor.....	\$0.15230	\$0.15230	\$0.10230	\$0.15230
Indirect materials.....	0.19199	0.20225	0.10637	0.28212
Indirect expense.....	0.04500	0.04500	0.04500	0.04050
Repairs, maintenance.....	0.02000	0.02000	0.02000	0.02000
Power, light, heat, water.....	0.21050	0.21050	0.21050	0.21050
Insurance and taxes.....	0.08200	0.08200	0.08200	0.08200
Depreciation.....	0.30001	0.423242	0.461627	0.310576
	<u>\$1.0018</u>	<u>\$1.1353</u>	<u>\$1.0278</u>	<u>\$1.0980</u>

Composite standard cost—amount:

Indirect labor.....	\$137,592	\$ 192,904	\$ 143,177	\$ 143,779
Indirect materials.....	174,391	256,181	148,878	266,340
Indirect expense.....	40,654	56,997	62,981	38,234
Repairs, maintenance.....	18,068	25,332	27,991	18,881
Power, light, heat, and water.....	190,171	266,620	294,612	198,723
Insurance and taxes.....	74,081	103,861	114,765	77,412
Depreciation.....	271,029	536,081	646,086	293,200
	<u>\$905,988</u>	<u>\$1,437,980</u>	<u>\$1,438,493</u>	<u>\$1,036,571</u>

MILEAGE TIRE COMPANY PERFORMANCE

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THE MILEAGE TIRE COMPANY

Marketing Costs

B-5

<i>Costs:</i>	<i>Year 1926</i>		<i>First</i>	<i>Second</i>	<i>Third</i>	<i>Fourth</i>
<i>Sales Manager</i>	<i>Amount</i>	<i>Per Unit</i>	<i>Quarter</i>	<i>Quarter</i>	<i>Quarter</i>	<i>Quarter</i>
Salaries.....	\$ 6,245,179	\$0.2966	\$1,218,034	\$1,651,243	\$1,975,735	\$1,400,166
Commissions.....	5,032,359	0.2390	981,491	1,330,570	1,592,045	1,128,252
Traveling.....	1,987,676	0.0944	387,668	525,547	628,824	445,636
Warehousing and Ship- ping.....	1,768,695	0.0840	344,959	467,648	559,547	396,540
Other expenses.....	296,888	0.0141	57,903	78,498	93,924	66,562
	<u>\$15,330,799</u>	<u>\$0.7281</u>	<u>\$2,990,056</u>	<u>\$4,053,507</u>	<u>\$4,850,077</u>	<u>\$3,437,157</u>

*Costs:**Publicity Manager*

Salaries.....	\$ 448,490	\$0.0213	\$ 87,471	\$ 118,582	\$ 141,885	\$ 100,551
Advertising.....	5,223,968	0.2481	1,018,861	1,381,232	1,652,663	1,171,211
	<u>\$ 5,672,458</u>	<u>\$0.2694</u>	<u>\$1,106,333</u>	<u>\$1,499,814</u>	<u>\$1,794,548</u>	<u>\$1,271,762</u>

*Costs:**Manager of Marketing*

Salaries.....	\$ 471,652	\$0.0224	\$ 91,989	\$ 124,706	\$ 149,212	\$ 105,744
Traveling.....	157,919	0.0075	30,799	41,754	49,559	35,405
Entertainment.....	134,757	0.0064	26,282	35,630	42,632	30,212
Rentals.....	3,476,328	0.1651	678,009	919,151	1,099,777	779,391
Other expenses.....	174,763	0.0083	34,085	46,208	55,288	39,181
	<u>\$ 4,415,421</u>	<u>\$0.2097</u>	<u>\$ 861,165</u>	<u>\$1,167,450</u>	<u>\$1,396,870</u>	<u>\$ 989,935</u>

To B..... \$25,418,680 \$1.2072 \$4,957,556 \$6,720,772 \$8,041,496 \$5,698,855

Sales in units..... 21,055,898 4,106,657 5,567,240 6,661,279 4,720,722

THE MILEAGE TIRE COMPANY

Management Costs, Other

B-6

<i>Organization Units</i>	<i>Year</i>	<i>Per</i>	<i>First</i>	<i>Second</i>	<i>Third</i>	<i>Fourth</i>
	<i>1926</i>	<i>Unit</i>	<i>Quarter</i>	<i>Quarter</i>	<i>Quarter</i>	<i>Quarter</i>
<i>Costs:</i>						
Chief executive.....	\$ 1,756,061	\$0.0834	\$ 342,495	\$ 464,307	\$ 555,550	\$ 393,708
<i>Costs:</i>						
Manager of standards and records:						
Controller.....	\$ 1,711,844	\$0.0813	\$ 333,871	\$ 452,616	\$ 541,561	\$ 383,794
Cost.....	1,111,751	0.0528	216,831	293,950	351,715	249,254
Budget.....	21,055	0.0010	4,106	5,567	6,661	4,720
Accounting.....	2,217,186	0.1053	432,430	586,230	701,432	497,092
Statistical.....	1,299,148	0.0617	253,380	343,498	411,000	291,268
	<u>\$ 6,360,986</u>	<u>\$0.3021</u>	<u>\$1,240,621</u>	<u>\$1,681,863</u>	<u>\$2,012,372</u>	<u>\$1,426,130</u>
<i>Costs:</i>						
Manager of Personnel						
Personnel.....	\$ 5,152,378	\$0.2447	\$1,004,898	\$1,362,303	\$1,630,014	\$1,155,160
Employment.....	1,600,248	0.0760	312,105	423,110	506,257	358,774
Training.....	96,857	0.0046	18,890	25,609	30,641	21,715
	<u>\$ 6,849,483</u>	<u>\$0.3253</u>	<u>\$1,335,895</u>	<u>\$1,811,023</u>	<u>\$2,166,914</u>	<u>\$1,535,650</u>
To B.....	<u>\$14,966,532</u>	<u>\$0.7108</u>	<u>\$2,919,011</u>	<u>\$3,957,194</u>	<u>\$4,734,837</u>	<u>\$3,355,489</u>

THE MILEAGE TIRE COMPANY

Variations from Standard Cost of Goods Sold

B-7

<i>Actual cost of:</i>	<i>First Quarter</i>	<i>Second Quarter</i>	<i>Third Quarter</i>	<i>Fourth Quarter</i>	<i>Total</i>
Labor	\$ 2,346,542	\$ 3,264,640	\$ 3,813,708	\$ 2,588,866	\$12,013,758
Materials	14,466,882	19,147,167	21,049,569	14,439,284	69,102,904
Overhead. . . .	2,499,989	4,102,114	5,369,657	3,679,513	15,651,274
	<u>\$19,313,413</u>	<u>\$26,513,922</u>	<u>\$30,232,935</u>	<u>\$20,707,665</u>	<u>\$96,767,937</u>

Standard cost of:

Labor	\$ 2,238,076	\$ 3,197,982	\$ 3,771,543	\$ 2,556,835	\$11,764,438
Materials	14,123,262	18,964,284	21,279,527	14,169,214	68,536,283
Overhead	2,414,959	4,035,010	5,309,921	3,582,439	15,342,330
To B-4	<u>\$18,776,298</u>	<u>\$26,197,277</u>	<u>\$30,460,992</u>	<u>\$20,308,489</u>	<u>\$95,643,056</u>

Variations in:

Labor	\$108,465	\$ 66,657	\$ 42,165	\$ 32,031	\$ 249,319
Materials	343,619	182,883	229,956*	270,069	566,616
Overhead	85,029	67,104	59,735	97,074	308,944
To B	<u>\$537,115</u>	<u>\$316,645</u>	<u>\$128,056*</u>	<u>\$399,175</u>	<u>\$1,124,880</u>

* Red.

THE MILEAGE TIRE COMPANY

Variations in Marketing Expenses

B-8

<i>Organization Units</i>	<i>1926 Total</i>	<i>First Quarter</i>	<i>Second Quarter</i>	<i>Third Quarter</i>	<i>Fourth Quarter</i>
Expenses:					
Sales manager	\$140,118*	\$402,454	\$456,666*	\$344,181*	\$258,275
Publicity manager	28,861	174,042	66,086	193,494*	17,773*
Manager of marketing . .	103,906	209,519	106,844*	106,264*	137,496
To B	<u>\$ 7,350*</u>	<u>\$786,015</u>	<u>\$527,424*</u>	<u>\$643,940*</u>	<u>\$377,997</u>

NOTE: These data are secured by subtracting the standard expenses from the actual expenses.

MILEAGE TIRE COMPANY PERFORMANCE

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THE MILEAGE TIRE COMPANY
Variations in Other Management Expenses

B-9

Organization Units	1926 Total	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
Expenses:					
Chief executive.....	\$35,580	\$ 77,706	\$ 23,386*	\$ 70,260*	\$ 51,520
Controller.....	80,355*	252,064	154,873*	318,496*	140,949
Manager of personnel....	93,380	262,401	113,130*	168,548*	112,658
To B.....	\$48,605	\$592,172	\$291,390*	\$557,305*	\$305,127

NOTE: These data are secured by subtracting the standard expenses from the actual expenses.

Other Income.—The other income for the year of \$8,368,448 is composed of the following items: (a) rents received; (b) gain or loss on miscellaneous sales of: (1) obsolete finished goods, (2) obsolete raw materials, (3) obsolete supplies, (4) miscellaneous sales; (c) dividends received and accrued; (d) interest income; (e) cash discounts; (f) other miscellaneous income. The company's reports show these items in considerable detail, but such analyses are omitted in this treatise to conserve space.

THE MILEAGE TIRE COMPANY

Other Expenses

B-10

Items	Year 1926	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
Other Expenses:					
Inventory Price					
Adjustments.....	B-10-1 \$ 469,200	\$ 199,642	\$ 195,722	\$ 73,835	— 0 —
Depreciation of idle equipment.....	B-10-2 274,427	254,114	26,572	210,303*	\$ 204,043
Depreciation of idle overhead.....	B-10-3 33,602	24,303	7,271	16,260*	18,288
Other items, not listed here, including taxes, discounts allowed, extraordinary expense, etc.....	6,890,259	812,125	1,750,673	2,578,048	1,749,412
To B.....	\$7,667,489	\$1,290,185	\$1,980,240	\$2,425,320	\$1,971,744

* Red.

THE MILEAGE TIRE COMPANY

Inventory Price Adjustments of Finished Goods

B-10-1

Items	1926 Total	First Quarter	Second Quarter	Third Quarter
Balloon tires.....	\$129,933	\$ 65,964	\$ 52,503	\$11,464
Balloon tubes.....	96,238	73,064	16,657	6,516
To B-10.....	\$469,200	\$199,642	\$195,722	\$73,835

* Red.

ACCOUNTING FOR EXECUTIVE CONTROL

THE MILEAGE TIRE COMPANY

Analysis of Depreciation on Idle Equipment

B-10-2

<i>Summary, 1926</i>	<i>First Quarter</i>	<i>Second Quarter</i>	<i>Third Quarter</i>	<i>Fourth Quarter</i>
Balloon casings.....	\$ 59,245	\$73,035*	\$134,425*	\$ 51,926
Balloon tubes.....	36,143	3,845	467*	32,806
To B-10.....	\$254,114	\$26,572	\$210,303*	\$204,043

NOTE: This summary is derived by multiplying the idle facilities quarterly rate by the sales units of that period.

* Red.

THE MILEAGE TIRE COMPANY

Analysis of Depreciation—Non-Manufacturing

B-10-3

	<i>Sales Units</i>	<i>Depreciation on Used Capacity</i>		<i>Depreciation on Idle Capacity</i>	
		<i>Per Unit</i>	<i>Amount</i>	<i>Per Unit</i>	<i>Amount</i>
First quarter.....	4,106,657	\$0.013232	\$ 54,339	\$0.005918	\$24,303
Second quarter.....	5,567,240	0.017844	99,341	0.001306	7,270
Third quarter.....	6,661,279	0.021591	143,823	0.002441*	16,260*
Fourth quarter.....	4,720,722	0.015276	72,113	0.003874	18,288
To B-10.....	21,055,898		\$369,618		\$33,601

NOTE: The depreciation of \$369,618 is charged through B-5 and B-6, though the amount has not been shown therein.

* Red.

CHAPTER XXVIII

ANALYSIS OF VARIATIONS IN SALES

Analysis of Total Variations.—In reviewing the sales of the business, the sales estimate or budget serves as a base from which comparisons should be made. To use any other base than the budget is to lose sight of the measuring stick set up for management purposes. It should be emphasized again, however, that the budget is not a complete measuring stick in itself. The estimated sales of the Mileage Tire Company for each product and for each quarter compared to the actual sales, are shown in Table 48. The increases and the decreases are also shown.

The variations in cord tires do not amount to as much as one per cent during any quarter of 1926. Variations in high pressure tube sales were less than one-fourth of one per cent for two quarters, while in the first quarter the variation was about one and one-half per cent below the budget. In the third quarter the sales ran ahead of the

TABLE 48

THE MILEAGE TIRE COMPANY

*Analysis of Variations in Sales by Products and by Quarters*¹

	<i>Estimated Sales</i>	<i>Actual Sales</i>	<i>Decrease Increase*</i>
<i>First Quarter</i>			
Cord tires	\$10,894,450	\$10,824,202	\$ 70,248
High pressure tubes	3,096,200	3,047,729	48,471
Balloon tires	13,414,200	13,405,485	8,715
Balloon tubes	2,544,350	2,531,833	12,517
	<hr/> \$29,949,200	<hr/> \$29,809,249	<hr/> \$139,951
<i>Second Quarter</i>			
Cord tires	\$15,979,300	\$15,872,494	\$106,806
High pressure tubes	3,574,100	3,577,788	3,688*
Balloon tires	18,815,100	18,757,524	57,476
Balloon tubes	3,533,100	3,536,369	3,269*
	<hr/> \$41,901,500	<hr/> \$41,744,175	<hr/> \$157,325

¹ The third and fourth quarters are omitted.

budget about three and one-half per cent. In balloon tires the variation is almost nothing during the first and second quarters, while in the other quarters, sales were over the budget by less than one per cent. There were slight variations in balloon tubes during the first and second quarters, and increases over the budget for the other quarters of about two per cent. The variations do not appear to be excessive. Much valuable information would be lost, however, if the study were not carried farther than to find that the net variations on first showing appeared unreasonable.

Analysis of Unit and Price Variations.—An analysis of the net variations into their two major parts gives a logical approach to the study of variations. These components are units and prices. This may be seen from the following simple illustration:

Sales budget	100 units @ \$3.50 each	\$350.00
Actual sales	102 " @ 3.60 "	367.20
Variations	2 " @ \$0.10 "	\$ 17.20
Price variations	100 units @ \$0.10 each	\$10.00
Unit variations	2 " @ \$3.60 "	7.20 \$ 17.20

The same principles have been used in securing the quantity and the price variations shown in Table 49.

TABLE 49
THE MILEAGE TIRE COMPANY
*Analysis of Unit and Price Variations*¹

<i>First Quarter</i>	<i>Total</i>	<i>Unit</i>	<i>Price</i>
Cord tires	\$ 70,248	\$ 63,015	\$ 7,233
High pressure tubes	48,471	52,314	3,843*
Balloon tires	8,715	10,773*	19,488
Balloon tubes	12,517	8,610	3,907
	<u>\$139,951</u>	<u>\$113,166</u>	<u>\$26,785</u>
<i>Second Quarter</i>			
Cord tires	\$106,806	\$ 93,405	\$13,401
High pressure tubes	3,688*	13*	3,675*
Balloon tires	57,476	92,566	35,090*
Balloon tubes	3,269*	2,246*	1,023*
	<u>\$157,325</u>	<u>\$183,712</u>	<u>\$26,387*</u>

* Increase over budget.

¹ The third and fourth quarters are omitted.

The Sales Quota Problem.—The sales quota has to do with the apportionment of the estimated total sales to the several sales territories.

The managers of the Mileage Tire Company were not content to base their sales quotas on an arbitrary basis, nor on the basis of past experience. To meet with their approval, the total quotas must be forecast from a knowledge of some related data that will serve as forecasting media. The total quotas must be adjusted in the light of performance, before the forecast shall serve as a basis for judging the effectiveness of the sales effort.

In the endeavor to secure suitable media for forecasting distinct quotas, several classes of data were tested to see which data appeared to give the best results. In Chapter XXV it was shown that there is a close relationship between automobile registration and pneumatic tire shipments. There are no published statistics, however, to show the tire shipments to the several states for use on consumers' automobiles. Statistics have been published for automobile registration for as far back as the data seem to be significant—namely, 1918 and 1919. It would seem quite illogical to assume that tire consumption in the United States is proportional to the number of automobiles registered. The difference in the physical conditions of the roads in the several states is significant. Studies have shown that the "average automobile" runs many more miles per year in good road states than in poor road states. Other factors may be considered that would show apparent differences in the consumption of tires, but what is needed are data already tabulated which will yield the desired results. These data may be discovered by research.

The research which proved of most value for setting sales quotas for the Mileage Tire Company may be described briefly. It was assumed that income would affect the sales of both automobiles and tires, as well as the registration of automobiles. The Purchasing Power Index developed by Mr. H. G. Weaver¹ was used as a basis for grouping the automobile registrations of various states. The unit sales of the Mileage Tire Company were grouped in the same manner. A number of groupings was made. The grouping shown in Table 50 was the one finally chosen because of its resemblance to the data of the Mileage Tire Company. These data are charted in Figure 34.

Mileage Tire Sales.—The sales of the Mileage Tire Company, other than sales to manufacturers, are shown in Table 51. The figures are shown in units and percentages. The forecast for 1926 is shown in comparison to performance. The forecast of tire sales was about 25,000 tires under performance, which is about three-tenths of one per

¹ *Harvard Business Review*, April, 1926.

cent error in the estimate. Preliminary figures for each quota are made from an average of the sales performance during the past two or three years. These figures are adjusted to allow for the probable increased or decreased registration of automobiles in particular groups of states. A study of Figure 34 discloses that automobile registration in each group of states is not increasing at the same rate. Two parallel lines on the chart indicate that the percentage increase in each

TABLE 50

AUTOMOBILE REGISTRATION GROUPED ACCORDING TO "EFFECTIVE INCOME—K"

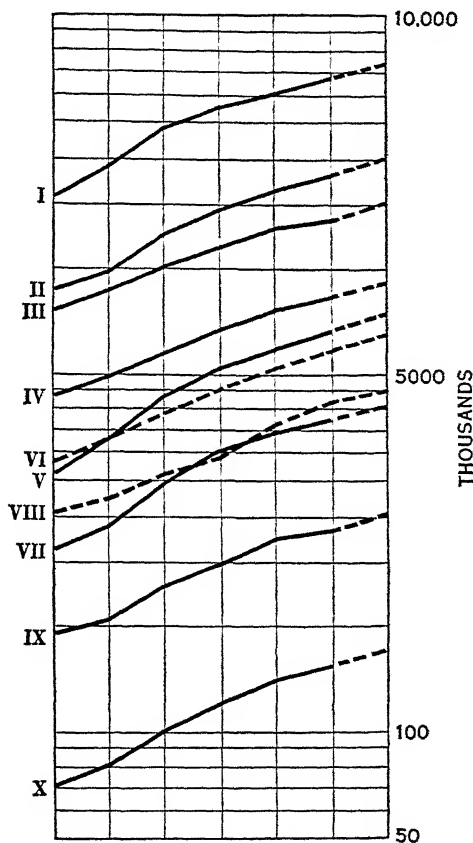
<i>States</i> <i>Group I</i>	<i>K</i>	1921	1926	<i>States</i> <i>Group VI</i>	<i>K</i>	1921	1926
New York.....	14.79	663.5	1508.3	Alabama.....	1.09	73.3	198.0
Pennsylvania.....	9.18	632.5	1264.5	West Virginia.....	1.08	77.4	201.6
Illinois.....	7.61	583.4	1195.9	Nebraska.....	1.03	219.8	338.0
Ohio.....	5.75	622.0	1295.0	Colorado.....	.99	136.3	227.7
California.....	5.08	645.5	1384.2	Arkansas.....	.84	60.1	179.5
	<u>42.41</u>	<u>3146.9</u>	<u>6647.9</u>		<u>5.03</u>	<u>566.9</u>	<u>1144.8</u>
<i>Group II</i>				<i>Group VII</i>			
Massachusetts.....	5.00	305.5	593.2	South Carolina.....	.84	83.0	163.5
Michigan.....	3.82	426.7	969.7	Oregon.....	.83	103.8	214.9
New Jersey.....	3.73	248.5	531.8	Washington.....	.75	60.5	184.1
Texas.....	3.61	417.2	944.9	Idaho.....	.74	44.9	91.8
Missouri.....	2.84	311.8	587.9	District of Columbia..	.69	35.4	97.8
	<u>19.00</u>	<u>1709.7</u>	<u>3627.5</u>		<u>3.85</u>	<u>327.6</u>	<u>752.1</u>
<i>Group III</i>				<i>Group VIII</i>			
Indiana.....	2.49	357.0	665.1	Maine.....	.69	67.6	124.2
Wisconsin.....	2.34	320.6	582.0	Florida.....	.62	83.1	331.9
Iowa.....	1.99	430.1	648.2	Montana.....	.50	56.4	88.8
Minnesota.....	1.97	299.1	559.1	South Dakota.....	.48	111.0	153.8
Connecticut.....	1.57	110.0	222.2	North Dakota.....	.43	90.2	145.6
	<u>10.36</u>	<u>1516.8</u>	<u>2676.6</u>		<u>2.72</u>	<u>408.3</u>	<u>844.3</u>
<i>Group IV</i>				<i>Group IX</i>			
Washington.....	1.53	157.6	310.4	New Hampshire.....	.43	37.0	78.4
Kansas.....	1.50	267.9	441.4	Idaho.....	.38	47.0	86.4
Maryland.....	1.48	124.7	240.7	Utah.....	.37	40.6	72.9
Oklahoma.....	1.47	197.5	450.0	Arizona.....	.34	31.6	63.3
Georgia.....	1.45	117.8	242.0	Vermont.....	.30	33.8	68.5
	<u>7.43</u>	<u>865.5</u>	<u>1684.5</u>		<u>1.82</u>	<u>190.0</u>	<u>369.5</u>
<i>Group V</i>				<i>Group X</i>			
Virginia.....	1.42	122.0	273.8	Wyoming.....	.25	24.0	44.4
Kentucky.....	1.41	111.8	252.6	New Mexico.....	.25	21.2	53.2
North Carolina.....	1.36	134.9	352.2	Delaware.....	.23	19.1	36.2
Tennessee.....	1.24	102.8	254.4	Nevada.....	.11	10.0	19.3
Louisiana.....	1.12	67.3	204.0		<u>.84</u>	<u>74.3</u>	<u>153.1</u>
	<u>6.55</u>	<u>538.8</u>	<u>1337.0</u>	Total.....	<u>100.01</u>	<u>9344.8</u>	<u>19237.3</u>

Units: Thousands of passenger automobiles.

Source: Automobile Chamber of Commerce.

series of data is at the same rate, while a line that rises more rapidly than another line is increasing at a higher ratio.

The data for automobile registration by groups of states, as shown in Table 51, are reduced to a percentage form. These percentages are shown in Table 52. A comparison of the percentages for the com-



The Mileage Tire Company
Figure 34. Automobile Registration by Groups of States.

pany and the automobile registration discloses a high degree of similarity.

A still better way to show the similarity of tire sales to automobile registration by groups of states is to plot the data on a "similarity chart." The sales of the company may be plotted along the x axis while the automobile registration is plotted along the y axis. When the points representing the paired values of tires and automobile registra-

TABLE 51

THE MILEAGE TIRE COMPANY

Unit Tire Sales of Other than Original Equipment, by Groups of States.

<i>Groups of States</i>	1921	1922	1923	1924	1925	1926	1926*	1927*
I.....	2,299.7	1,677.5	1,949.3	2,186.0	2,482.6	2,535.8	2,557.3	2,806.8
II.....	667.2	836.4	982.5	1,136.3	1,358.5	1,390.7	1,353.9	1,509.9
III.....	602.5	750.0	825.6	889.7	1,031.8	1,023.0	1,038.2	1,145.9
IV.....	342.3	425.0	482.3	530.9	636.6	655.4	684.1	707.3
V.....	211.2	272.3	325.0	387.9	478.9	507.2	483.6	533.2
VI.....	214.8	269.0	315.3	356.4	422.7	433.0	422.1	471.2
VII.....	125.5	154.6	182.1	210.3	257.2	268.8	260.7	286.1
VIII.....	148.4	184.0	210.2	230.2	280.7	294.3	282.4	312.3
IX.....	63.8	81.3	93.2	105.4	124.3	125.0	126.0	138.3
X.....	16.6	20.0	23.7	27.3	31.9	32.7	32.0	35.8
	3,692.0	4,670.1	5,389.2	6,060.4	7,105.2	7,365.9	7,240.3	7,946.8
<i>Yearly Percentage of Unit Sales Other than Original Equipment</i>								
I.....	35.20	35.92	36.17	36.07	34.94	34.90	35.32*	35.32*
II.....	18.07	17.91	18.23	18.75	19.12	19.14	18.70	19.00
III.....	16.32	16.06	15.32	14.68	14.52	14.08	14.34	14.42
IV.....	9.27	9.10	8.95	8.76	8.96	9.02	9.45	8.90
V.....	5.72	5.83	6.03	6.40	6.74	6.98	6.68	6.71
VI.....	5.82	5.76	5.85	5.88	5.95	5.96	5.83	5.93
VII.....	3.40	3.31	3.38	3.47	3.62	3.70	3.60	3.60
VIII.....	4.02	3.94	3.90	3.80	3.95	4.05	3.90	3.93
IX.....	1.73	1.74	1.73	1.74	1.75	1.72	1.74	1.74
X.....	.45	.43	.44	.45	.45	.45	.44	.45
	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

*Estimated.

Units: Thousands.

TABLE 52

PERCENTAGE OF AUTOMOBILE REGISTRATION IN THE UNITED STATES, BY GROUPS OF STATES

<i>Group of States</i>	1921	1922	1923	1924	1925	1926	1926*	1927*
I.....	33.67	35.22	35.62	34.98	34.28	34.56	34.66	34.58
II.....	18.30	17.78	18.30	18.79	19.07	18.86	18.73	18.92
III.....	16.23	15.71	14.98	14.66	14.34	13.91	14.58	14.30
IV.....	9.26	9.07	8.66	8.64	8.70	8.76	8.68	8.70
V.....	5.76	6.00	6.39	6.70	6.80	6.95	6.63	6.82
VI.....	6.07	5.98	5.94	5.87	5.96	5.95	5.92	5.93
VII.....	3.51	3.47	3.66	3.90	3.92	3.90	3.85	3.91
VIII.....	4.37	4.08	3.81	3.77	4.13	4.39	4.21	4.10
IX.....	2.03	1.92	1.88	1.89	2.00	1.92	1.94	1.94
X.....	.80	.77	.76	.80	.80	.80	.80	.80
	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

*Estimated.

tion are joined together, a relatively straight line is formed. The series are too short, however, to show a highly reliable measure of similarity.

Comparing Quotas and Performance.—When the quota is assigned it is not known, of course, how many automobiles will be registered in each group of states. The quota, then, should be provisional as a means of judging efficiency. A comparison of the 1926 quota with 1926 performance, properly adjusted, is shown in Table 53. The actual automobile registration over or under the estimated registration is shown in Column 2 of Table 53. The details necessary to arrive

TABLE 53
COMPARISON OF 1926 QUOTAS WITH 1926 PERFORMANCE AND THE DETERMINATION OF
MEASURE OF EFFICIENCY

*The columns of this table indicate:

(1) <i>States</i>	(2)	(3)	(4)	(5)	(6)	(7)
I.....	.1	34.14	.04	21.5*	21.54	.00322
II.....	35.1	38.33	13.45	36.8	23.35*	.00641*
III.....	119.8*	38.22	45.78*	15.2*	30.58*	.01146*
IV.....	19.7	38.90	7.66	28.7*	36.36	.02152
V.....	65.4	37.93	24.81	23.6	1.21	.00090
VI.....	9.3	34.78	3.23	10.9	7.67*	.00584*
VII.....	13.6	35.74	4.86	8.1	3.24*	.00432*
VIII.....	36.9	34.86	12.86	11.9	.96	.00113
IX.....	2.6*	33.83	.87*	1.0*	.13	.00351
X.....	.4*	21.36	.08*	.7	.78*	.00509*
		<hr/>	<hr/>	<hr/>	<hr/>	
	57.3		20.18	25.6	5.42*	

*Red.

Unit: 1000.

at these figures are not given herein. It should be observed, however, that the actual registration was only 57,300 over the estimate.

Any errors in estimating performance must be corrected before a comparison can be made with the company's figures. The per cent of sales of the company to the total automobile registration is shown in Column 3. That is, in Group II states, the company sold on an average of 3,833 tires to each 10,000 automobiles registered. The forecast of automobile registration was 35,100 under the number registered. The index of comparison, Column 4, is obtained by the multiplication of Column 2 by Column 3. The differences between the estimated sales and the actual sales of the company are shown in Column 5. The sales were 25,600 (Column 5) more than the estimate. In Column 4

are given the extra sales that would have been added to the quotas had the exact number of registrations been known in advance. The net result of the year is that only 5,420 more tires have been sold than should have been sold to register a "perfect hit." All of the quotas, however, reflect different degrees of performance. The percentages of variation between the adjusted quotas and the performance are shown in Column 7. Group II states the performance was 23,350 (Column 6) more tires than the adjusted quota, but the variation was only .00641 (Column 5 divided by the actual registration). This is an efficiency percentage.

CHAPTER XXIX

ANALYSIS OF VARIATIONS IN MANUFACTURING COSTS

Analysis of Variations in the Cost of Goods Sold.—Cost variations may be grouped into two principal classes, as follows: (1) variations which are occasioned by the sale of more goods than was anticipated; (2) variations which are caused by the inability to produce each article at the price set for its production. The first group of variations are referred to as variations "in" the cost of goods sold, and the latter class of variations are called variations "from" standard.

The variations "in" the cost of goods sold are shown by quarterly periods for the year 1926 in Table 54. In each case the increase or

TABLE 54
THE MILEAGE TIRE COMPANY
Analysis of Variations "in" the Cost of Goods Sold

<i>1926 First Quarter</i>	<i>Budget Units</i>	<i>Actual Units</i>	<i>Increase Decrease*</i>	<i>Stand- ard Rate</i>	<i>Total</i>	<i>Amount Actual</i>	<i>Amount Budget</i>
Balloon tires.....	902,700	903,428	728	9.4638	\$ 6,889	\$ 8,549,861	\$ 8,542,972
Balloon tubes.....	965,400	961,790	3,610*	1.5571	5,621*	1,497,603	1,503,224
	4,138,900	4,106,657	32,243*		\$ 73,608*	\$18,776,298	\$18,849,906
<i>Second Quarter</i>							
Balloon tires.....	1,273,500	1,266,608	6,892*	9.2995	\$ 64,092*	\$11,778,821	\$11,842,913
Balloon tubes.....	1,367,500	1,368,560	1,060	1.5055	1,595	2,060,367	2,058,771
	5,581,600	5,567,240	14,360*		\$126,230*	\$26,197,277	\$26,323,507
<i>Third Quarter</i>							
Balloon tires.....	1,389,000	1,399,585	10,585	*9.1431	\$ 96,779	\$12,796,545	\$12,699,765
Balloon tubes.....	1,403,800	1,425,794	11,994	1.4613	32,139	2,083,512	2,051,372
	6,640,800	6,661,279	10,479		\$116,973	\$30,360,992	\$30,244,018
<i>Fourth Quarter</i>							
Balloon tires.....	934,500	944,054	9,554	9.0124	\$ 86,104	\$ 8,508,192	\$ 8,422,087
Balloon tubes.....	1,013,200	1,028,787	15,587	1.4408	22,457	1,482,276	1,459,818
	4,698,600	4,720,722	22,122		\$ 61,462	\$20,308,489	\$20,247,027

*Red.

decrease of the actual number of units sold over the sales budget, when multiplied by the standard rate per unit, will give the amount of the increase or decrease in total cost.

The dollar values for labor, material, and overhead variations "from" standard are shown in B-7 of Chapter XXVII, and in Table 55. This class of variation is of considerable importance, but before

TABLE 55
THE MILEAGE TIRE COMPANY
Analysis of Variations "from" Budget—Cost of Goods Sold

<i>First Quarter</i>	<i>Actual</i>	<i>Budget</i>	<i>Decrease Increase*</i>
Labor.....	\$108,466	\$ 66,566	\$ 41,900*
Materials.....	343,620	126,747	216,873*
Overhead.....	85,030	34,280	50,750*
	<u>\$537,116</u>	<u>\$227,593</u>	<u>\$309,523*</u>
<i>Second Quarter</i>			
Labor.....	\$ 66,657	\$ 19,846	\$ 46,811*
Materials.....	182,884	130,006	52,878*
Overhead.....	67,104	33,046	34,058*
	<u>\$316,645</u>	<u>\$182,898</u>	<u>\$133,747*</u>
<i>Third Quarter</i>			
Labor.....	\$ 42,165	\$ 32,456	\$ 9,709*
Materials.....	229,957*	137,903	367,860
Overhead.....	59,736	39,622	20,114*
	<u>\$128,056*</u>	<u>\$209,981</u>	<u>\$338,037</u>
<i>Fourth Quarter</i>			
Labor.....	\$ 32,031	\$ 16,349	\$ 15,682*
Materials.....	270,069	123,814	146,255*
Overhead.....	97,075	45,810	51,265*
	<u>\$399,175</u>	<u>\$185,973</u>	<u>\$213,202*</u>

*Red.

the subject is discussed further, something will be said about variations from the budget.

Variations from the Budget.—The budget anticipates variations from standard cost in the cost of goods sold. An analysis of the variations "from" the budget for the cost of goods sold is shown in Table 55. The variations are the results of many causes. The ultimate causes of these variations cannot be ascertained, but the information

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furnishes some valuable data on the results of forecasting. This table is a summary of figures which show the variations by lines. The analysis can be carried only so far as the budget goes.

A high degree of accuracy in forecasting is shown by the comparatively small amount of variations between the budget and the performance. For most administrative and management purposes the budget made three months in advance for each quarter of 1926 was as good as knowing the actual results.

Variations from Standard.—In cost accounting, variations between the standard and the performance cost are to be expected. One of the most important sources of information furnished by standard costs is found by the analyses of causes for variation in costs. The causes for variations may be ascertained and the significant variations brought to the attention of the proper executives. A summary analysis of the variations may serve to put the executive on notice as to the

TABLE 56
THE MILEAGE TIRE COMPANY
Analysis of Variations "in" Cost of Goods Sold, 1926

<i>Variations in Labor</i>	<i>Total</i>	<i>First Quarter</i>	<i>Second Quarter</i>	<i>Third Quarter</i>	<i>Fourth Quarter</i>
Idleness.....	\$217,518	\$101,637	\$ 46,320	\$ 32,621	\$ 36,940
Rates of pay.....	3,052*	7,816*	6,043	14,690*	13,411
Hours worked.....	34,853	14,645	14,294	24,234	18,320*
	<u>\$249,319</u>	<u>\$108,466</u>	<u>\$ 66,657</u>	<u>\$ 42,165</u>	<u>\$ 32,031</u>
<i>Variations in Materials</i>					
Quantity consumed.....	\$627,613	\$144,980	\$121,643	\$182,345	\$178,645
Price.....	60,997*	198,640	61,241	412,302	91,424
	<u>\$566,616</u>	<u>\$343,620</u>	<u>\$182,884</u>	<u>\$229,957*</u>	<u>\$270,069</u>
<i>Variations in Overhead</i>					
Indirect labor.....	\$ 48,260	\$ 3,986	\$ 18,675	\$ 8,645	\$ 16,954
Indirect materials.....	31,597	4,695	14,321	3,794	8,787
Indirect expense.....	19,009	1,684*	17,984	4,923*	7,632
Repairs, maintenance.....	33,739	3,796*	20,649	7,921	8,965
Power, light, heat, water	34,279	3,166*	15,916	14,964	6,565
Insurance and taxes.....	2,632	1,437*	1,694	695	1,680
	<u>\$169,516</u>	<u>\$ 1,402*</u>	<u>\$ 89,239</u>	<u>\$ 31,096</u>	<u>\$ 50,583</u>
Idleness.....	255,209	86,432	93,645	28,640	46,492
	<u>\$424,725</u>	<u>\$ 85,030</u>	<u>\$182,884</u>	<u>\$ 59,736</u>	<u>\$ 97,075</u>

* Red.

net extent to which variations of a positive and a negative character are taking place. Further analysis may show the specific places at which executive action is required.

Table 56 shows a summary analysis of the variations in cost of the Mileage Tire Company for each quarter of the year 1926. The variations are classified as to labor, material, and overhead variations. Each of these classes of cost are subdivided further to secure more information as to causes for variations.

TABLE 57
THE MILEAGE TIRE COMPANY
Analysis of Variations "from" Standard Cost, 1926, Balloon Tires

<i>Variations in Labor</i>	<i>Total</i>	<i>First Quarter</i>	<i>Second Quarter</i>	<i>Third Quarter</i>	<i>Fourth Quarter</i>
Idleness.....	\$ 98,781	\$ 65,945	\$ 16,321	\$ 7,894	\$ 8,621
Rates of pay.....	6,622*	3,978	3,214*	3,200*	4,186*
Hours worked.....	26,877*	31,798*	1,396*	4,622	1,695
	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
	\$ 65,282	\$ 38,125	\$ 11,711	\$ 9,316	\$ 6,130
<i>Variations in Material</i>					
Quantity consumed.....	\$ 8,163*	\$ 1,802*	\$ 12,645*	\$ 18,684*	\$ 24,968
Prices.....	419,421	112,806	103,595	116,465	86,555
	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
	\$411,258	\$111,004	\$ 90,950	\$ 97,781	\$111,523
<i>Variations in Overhead</i>					
Indirect labor.....	\$ 2,326	\$ 7,211	\$ 4,193*	\$ 3,798*	\$ 3,106
Indirect materials.....	4,592	3,264	2,986*	2,793	1,521
Indirect expenses.....	6,863	1,795	1,495*	1,942	4,621
Repairs, maintenance...	6,725	3,968	1,877*	3,105	1,529
Power, light, heat, and water.....	1,897*	1,036	2,890*	1,350	1,293
Insurance and taxes.....	1,798	1,232	1,088	122	644*
	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
	\$ 20,407	\$ 18,506	\$ 12,353*	\$ 5,414	\$ 8,840
Idleness.....	97,197	35,826	19,694	16,983	24,694
	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
	\$117,604	\$ 54,332	\$ 7,341	\$ 22,397	\$ 33,534

*Red.

Variation in Costs by Products.—The summary analysis of variations from standard cost is secured from the information furnished by the data for the several products. Table 57 shows the summary for balloon tires, while Table 56 shows the summary for all the products. This analysis shows the results obtained because of certain varia-

tions. This summary analysis shows the particular major branch of the fabricating phase of the business in which variations took place and resulted in dollar variations of a specified size.

Tire Manufacture.—A brief explanation of the major operations performed in the fabrication of a tire may be helpful in understanding that which is to follow. A tire is made of rubber, lamp black, cotton cords, wire hoops, or beads, and other minor materials. The raw rubber is mixed with lamp black and other ingredients. This material is passed between rollers, called calenders, and thoroughly worked and rolled into sheets. Sheets of rubber are run through other rollers at the same time cotton cord is admitted. Thus the cord becomes imbedded in the rubber. An additional coating of rubber is added to the sheets by a calendering process. This material, when finished, becomes "stock." The "stock" to be used in making the tread has no cords in it.

Steel wire is made into hoops. The hoops are coated with rubber. These are called beads. They are placed in the rims of tires to keep the rim from expanding.

The tread is composed of a rubber mixture. It is shaped by the use of dies and is cut to the length required for specified sizes of tires.

The assembling of the several parts of the tire is called "tire building." The workman places the plystock on a form which is somewhat the shape of the tire. Several plies, which have been cut properly, are placed together in such a manner that the cords run in different directions. These plies are cemented together and pressed against the form and superfluous stock cut off. The beads are securely fastened to the plystock as the building operation progresses. The tread is put on top and pressed into position. The assembly is complete.

The tire must then be cured. An air bag is put inside the tire, the tire is placed in a mold, and the mold is closed. The air bag is then inflated. A large number of these molds are put in a kiln and undergo a heat treatment. The heat vulcanizes the rubber and the assembled parts become a complete unit. The molds are taken from the kiln and stripped from the tires. The air bag is removed and the superfluous parts cut off. The completed tire is inspected. If defects are found they are mended, if not in too bad condition.

The finishing process is composed of whitewashing the inside of the tire, putting on any seals or marks not impressed in the tire by

the mold, inserting the flap or tube protector, and wrapping the tire with paper.

Departmental Analysis of Variations.—The manufacture of a complete tire necessitates many operations. The operations may be performed in departments or units of the business. There are distinct advantages in assembling the cost in accordance with physical operations. This is usually the classification which the engineer uses and the one that is used here.

The departmental analysis of variations should be divided into the three major groupings of cost; namely, labor, materials, and overhead. Table 58 shows the departmental analysis of variations in labor

TABLE 58

THE MILEAGE TIRE COMPANY

Departmental Analysis of Variations in Labor Cost, First Quarter of 1926, Balloon Tires

<i>Departments</i>	<i>Total</i>	<i>Idleness</i>	<i>Rates of Pay</i>	<i>Hours Worked</i>
1. Stock.....	\$28,390	\$ 3,520	\$13,980	\$10,890
2. Bead.....	18,300*	2,580	15,870*	5,010*
3. Air Bags.....	4,790*	895	2,484*	3,201*
4. Flaps.....	2,860*	1,298	1,426*	2,732*
5. Tread.....	12,300	2,840	3,050	6,410
6. Ply.....	21,820*	4,200	11,690*	14,330*
7. Assembly.....	44,927	24,895	8,321	11,711
8. Curing.....	37,860*	8,380	1,290	47,530*
9. Finishing.....	60,980	12,845	18,290	29,845
10. Inspection.....	13,950*	1,202	6,843*	8,309*
11. Tire Repair.....	8,892	3,290	2,640*	9,542*
	<u>\$38,125</u>	<u>\$65,945</u>	<u>\$ 3,978</u>	<u>\$31,798*</u>

* Red.

cost for the first quarter of 1926. The total amount of these variations is accounted for as follows: (a) excess idleness; (b) change in rates of pay; (c) variations in cost due to hours worked. The departmental distribution of the variations in material costs is shown in Table 59. This is shown for the first quarter of 1926. The principal variations are due (1) to variations in quantity consumed and (2) to the variations in prices paid.

The departmental analysis of variations in overhead costs in balloon tires sold during the first quarter of 1926 is shown in Table 60. It should be observed that there is no variation in depreciation in this analysis. This results from charging depreciation on a unit basis and making no adjustment for "actual" depreciation. The costs

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TABLE 59
THE MILEAGE TIRE COMPANY*Departmental Analysis of Variations in Material Cost, First Quarter of 1926,
Balloon Tires.*

<i>Departments</i>	<i>Total</i>	<i>Quantity Consumed</i>	<i>Prices</i>
1. Stock.....	\$104,980	\$24,695	\$ 80,285
2. Bead.....	10,210*	24,190*	13,980
3. Air bags.....	6,380*	8,532*	2,152
4. Flaps.....	3,220*	1,024*	2,196*
5. Tread.....	6,440	890	5,550
6. Ply.....	—0—	—0—	—0—
7. Assembly.....	5,220	1,208	4,012
8. Curing.....	—0—	—0—	—0—
9. Finishing.....	3,890	823	3,067
10. Inspection.....	—0—	—0—	—0—
11. Tire repair.....	10,284	4,328	5,956
	<u>\$111,004</u>	<u>\$ 1,802*</u>	<u>\$112,806</u>

* Red.

TABLE 60
THE MILEAGE TIRE COMPANY*Departmental Analysis of Variations in Overhead Costs, First Quarter of 1926, Balloon
Tires, and Expense Analysis of the Finishing Department.*

<i>Departments</i>	<i>Total</i>	<i>Expense Classes</i>	<i>Finishing Department Total</i>
1. Stock.....	\$10,460	Indirect labor.....	\$ 945
2. Bead.....	3,240*	Indirect materials.....	104*
3. Air bags.....	1,280*	Indirect overhead.....	3,612
4. Flaps.....	1,010*	Repairs, maintenance.....	1,371*
5. Tread.....	4,280	Power, light, heat, water.....	6,812*
6. Ply.....	8,960*	Insurance and taxes.....	285
7. Assembly.....	62,600	Idleness.....	16,427
8. Curing.....	8,120*		
9. Finishing.....	12,982		<u>\$12,982</u>
10. Inspection.....	4,980*		
11. Tire repair.....	8,400*		
	<u>\$54,332</u>		

* Red.

due to idleness are shown in total in the idleness columns of Tables 58 and 60. The causes for idleness should be shown on a Gantt Chart and responsibility assigned for significant items.

Analysis of Department Operations.—The analysis of the operations so as to show the variations which occur is just one step removed

TABLE 61

THE MILEAGE TIRE COMPANY

Analysis of Variations in Cost, First Quarter of 1926, Balloon Tires, Finishing Department.

<i>Processes and Operations</i>	<i>Total</i>	<i>Variations in Labor</i>		
		<i>Idleness</i>	<i>Rates of Pay</i>	<i>Hours</i>
Trim beads.....	\$27,999	\$ 8,625	\$ 6,390	\$12,984
Trim and turn tires.....	15,469	3,821	3,680	7,968
Whitewash.....	1,544	642	580*	1,482
Paint seals.....	1,416	872*	640	1,648
Flap tires.....	7,098*	1,296	1,498*	6,896*
Wrap tires.....	24,944	3,986*	13,483	15,447
Sorting.....	4,174*	1,560	1,840*	3,894*
Transporting.....	880	1,759	1,985*	1,106
	<u>\$160,908</u>	<u>\$12,845</u>	<u>\$18,290</u>	<u>\$29,845</u>
	<i>Total</i>	<i>Variations in Materials</i>		<i>Prices</i>
		<i>Quantity Consumed</i>		
Trim beads.....	—0—			
Trim and turn tires.....	—0—			
Whitewash.....	\$ 2,188*	\$ 890*	\$ 1,298*	
Paint seals.....	2,552*	920*	1,632*	
Flap tires.....	22,274	9,894	12,380	
Wrap tires.....	13,644*	7,261*	6,383*	
Sorting.....	—0—			
Transporting.....	—0—			
	<u>\$ 3,890</u>	<u>\$ 823</u>	<u>\$ 3,067</u>	

* Red.

from the actual variations. Table 61 shows the variations in labor and in materials for the finishing department for the first quarter of 1926. If the labor variations are analyzed according to workmen, the engineer can use this information to locate the probable individual weaknesses of workmen, the management, or other defects.

Table 62 shows the analysis of variations in overhead cost for the finishing department, balloon tires for the first quarter of 1926. The analysis of variations in labor, materials, and overhead, according to operations, gets the data in such a form that they have significance at the source. That is, the detailed data from which summaries are made are marshaled in such a manner that comparison between the standard and the performance may be made as the work is done, or soon thereafter. This makes the data valuable at the outset for management

TABLE 62

THE MILEAGE TIRE COMPANY

Analysis of Variations in Overhead Cost, First Quarter of 1926, Balloon Tires, Finishing Department

Operations	Total	Indirect			Repairs and Main- tenance	Power, Light, and Heat, Water	Insur- ance and Taxes	Idle- ness
		Labor	Mat.	Over- head				
Trim beads....	\$ 3,865	\$ 696*	\$1,500	\$1,201	\$ 894*	\$1,086*	\$895	\$ 3,845
Trim and turn tires..	6,398*	3,620*	—0—	894*	634	390*	488*	1,640*
White wash.....	1,122*	698	1,493*	398	896*	2,714	320*	3,205
Paint Seals.....	1,453*	3,145*	1,032	698	720	695*	496	559*
Flap tires.....	1,826*	2,306*	—0—	694	128	1,496*	142*	1,296
Wrap tires.....	13,980	6,895	1,292*	2,190	1,496*	1,206	183	6,294
Sorting.....	2,652	1,295	—0—	1,296*	621	109*	186*	2,327
Transporting.....	3,294	1,824	149	621	188*	628*	143*	1,659
	<u>\$12,982</u>	<u>\$ 945</u>	<u>\$ 104*</u>	<u>\$3,612</u>	<u>\$1,371*</u>	<u>\$6,812*</u>	<u>\$285</u>	<u>\$16,427</u>

*Red.

purposes. As the summaries are accumulated, the data become valuable again for other phases of management. Thus the data are built from the bottom. Variations from standard are detected shortly and causes for variations assigned to them. Summarization of the variations helps to set in relief the most significant general truths. If these summaries are drawn up properly, the controller will have little difficulty in interesting the manager of production, and those under his direction, in the findings because they can make use of it in current operations.

CHAPTER XXX

ANALYSIS OF VARIATIONS IN OTHER MANAGEMENT COSTS

Variations in Expense.—The variations in the standard cost of the marketing expenses are shown in Table 63. The budget figures were secured by the multiplication of the estimated unit expenses by

TABLE 63
THE MILEAGE TIRE COMPANY
Analysis of Variations in Marketing Expenses

<i>First Quarter</i>	<i>Budget</i>	<i>Actual</i>	<i>Increase Decrease*</i>	<i>Prices</i>	
Expenses, sales manager.....	\$3,013,533	\$2,990,057	\$23,476*	.7281	
Expenses, publicity ".....	1,115,020	1,106,333	8,687*	.2694	
Expenses, marketing ".....	867,927	861,166	6,761*	.2097	
	<u>\$4,996,480</u>	<u>\$4,957,556</u>	<u>\$38,924*</u>	<u>32,243</u>	<u>Units</u>
<i>Second Quarter</i>					
Expenses, sales manager.....	\$4,063,963	\$4,053,507	\$10,456*	.7281	
Expenses, publicity ".....	1,503,683	1,499,815	3,868*	.2694	
Expenses, marketing ".....	1,170,461	1,167,450	3,011*	.2097	
	<u>\$6,738,107</u>	<u>\$6,720,722</u>	<u>\$17,335*</u>	<u>14,360</u>	<u>Units</u>
<i>Third Quarter</i>					
Expenses, sales manager.....	\$4,835,166	\$4,850,077	\$14,911	.7281	
Expenses, publicity ".....	1,789,032	1,794,549	5,517	.2694	
Expenses, marketing ".....	1,392,576	1,396,870	4,294	.2097	
	<u>\$8,016,774</u>	<u>\$8,041,496</u>	<u>\$24,722</u>	<u>10,479*</u>	<u>Units</u>
<i>Fourth Quarter</i>					
Expenses, sales manager.....	\$3,421,051	\$3,437,158	\$16,107	.7281	
Expenses, publicity ".....	1,265,802	1,271,762	5,960	.2694	
Expenses, marketing ".....	985,297	989,935	4,638	.2097	
	<u>\$5,672,150</u>	<u>\$5,698,855</u>	<u>\$26,705</u>	<u>22,122*</u>	<u>Units</u>
Total for year.....	<u>\$25,423,511</u>	<u>\$25,418,680</u>	<u>\$ 4,831*</u>		

* Red.

the number of items to be sold. The "actual" expenses are secured by the multiplication of the estimated unit expenses by the actual number of units sold. The only variations between these two sets of data arise from a difference between the estimated units to be sold and the units actually sold.

The variations in the standard cost of expenses for the chief executive, the controller, and the manager of personnel are shown in Table 64. The amount shown in the "budget" and in the "actual" columns is the result of the multiplication of units by prices, as shown for marketing expenses.

Variations from Budget Expenses.—The variations from the budget cost of the marketing expenses are shown in Table 65. The

TABLE 64
THE MILEAGE TIRE COMPANY
Analysis of Variation in Other Management Expenses

<i>First Quarter</i>	<i>Budget</i>	<i>Actual</i>	<i>Increase Decrease*</i>	<i>Price in Cents</i>	
Expenses, chief executive.....	\$ 345,184	\$ 342,495	\$ 2,689	.0834	
Expenses, controller.....	1,250,362	1,240,621	9,741	.3021	
Expenses, personnel.....	1,346,384	1,335,896	10,488	.3253	
	<u>\$2,941,930</u>	<u>\$2,919,012</u>	<u>\$22,918</u>	<u>32,243*</u>	<u>Units</u>
<i>Second Quarter</i>					
Expenses, chief executive.....	\$ 465,505	\$ 464,308	\$ 1,197	.0834	
Expenses, controller.....	1,686,201	1,681,863	4,338	.3021	
Expenses, personnel.....	1,815,694	1,811,023	4,672	.3253	
	<u>\$3,967,401</u>	<u>\$3,957,194</u>	<u>\$10,207</u>	<u>14,360*</u>	<u>Units</u>
<i>Third Quarter</i>					
Expenses, chief executive.....	\$ 553,843	\$ 555,551	\$ 1,708*	.0834	
Expenses, controller.....	2,006,186	2,012,372	6,186*	.3021	
Expenses, personnel.....	2,160,251	2,166,914	6,663*	.3253	
	<u>\$4,720,280</u>	<u>\$4,734,837</u>	<u>\$14,557</u>	<u>10,479</u>	<u>Units</u>
<i>Fourth Quarter</i>					
Expenses, chief executive.....	\$ 391,863	\$ 393,708	\$ 1,845*	.0834	
Expenses, controller.....	1,419,447	1,426,130	6,683*	.3021	
Expenses, personnel.....	1,528,455	1,535,651	7,196*	.3253	
	<u>\$3,339,765</u>	<u>\$3,355,489</u>	<u>\$15,724*</u>	<u>22,122</u>	<u>Units</u>
	<u>\$14,969,376</u>	<u>\$14,966,532</u>	<u>\$ 2,844</u>		

* Red.

TABLE 65

THE MILEAGE TIRE COMPANY

Analysis of Variations from Budget—Marketing Expenses

	<i>Variations from Standard in Budget</i>	<i>Variations from Standard in Actual</i>	<i>Increase Decrease*</i>
<i>First Quarter</i>			
Expenses, sales manager.....	\$376,467	\$402,454	\$ 25,987
Expenses, publicity manager.....	154,980	174,042	19,062
Expenses, manager of marketing.....	142,073	209,519	67,446
	<u>\$673,520</u>	<u>\$786,015</u>	<u>\$112,495</u>
<i>Second Quarter</i>			
Expenses, sales manager.....	\$403,963*	\$456,667*	\$ 52,704
Expenses, publicity manager.....	56,317	66,086	9,769*
Expenses, manager of marketing.....	170,461*	138,844*	33,617*
	<u>\$518,107*</u>	<u>\$527,425*</u>	<u>\$ 9,318</u>
<i>Third Quarter</i>			
Expenses, sales manager.....	\$315,166*	\$344,181*	\$ 29,015
Expenses, publicity manager.....	189,032*	193,494*	4,462
Expenses, manager of marketing.....	92,576*	106,265*	13,689
	<u>\$596,774*</u>	<u>\$643,940*</u>	<u>\$ 47,166</u>
<i>Fourth Quarter</i>			
Expenses, sales manager.....	\$248,949	\$258,275	\$ 9,326*
Expenses, publicity manager.....	15,802*	17,773*	1,971
Expenses, manager of marketing.....	134,703	137,496	2,793*
	<u>\$367,850</u>	<u>\$377,998</u>	<u>\$ 10,148*</u>

* Red.

amounts shown in the "budget" column represent expenses that are expected to be incurred above or below the standard expense or cost. The standard expense of marketing is shown in Table 63. The standard expenses per unit have been set for a year. In planning for the balance sheet figures the estimated profit and loss items must be inserted, and this necessitates an adjustment in the standard cost or expense items. During the first and last quarters the expenses were higher than standard, but during the second and the third quarter, when sales were higher than they were in the first and the last quarter, the expenses were less than standard.

VARIATIONS IN OTHER MANAGEMENT COSTS 435

The amounts of variations in performance from the standard expenses are shown in the column for "actual" variations. The increases and decreases represent errors in estimating the several expenses for each executive.

TABLE 66
THE MILEAGE TIRE COMPANY

Analysis of Variations from Budget—Other Management Expenses

	<i>Variations from Standard in Budget</i>	<i>Variations from Standard in Actual</i>	<i>Decrease* Increase</i>
<i>First Quarter</i>			
Expense, chief executive.....	\$ 64,816	\$ 77,706	\$ 12,890
Expense, controller.....	209,638	252,065	42,427
Expense, personnel.....	243,616	262,401	18,785
	<hr/> \$518,070	<hr/> \$592,172	<hr/> \$ 74,102
<i>Second Quarter</i>			
Expense, chief executive.....	\$ 25,505*	\$ 23,386*	\$ 2,119*
Expense, controller.....	166,201*	154,873*	11,328*
Expense, personnel.....	125,695*	113,131*	12,564*
	<hr/> \$317,401*	<hr/> \$291,390*	<hr/> \$ 26,011*
<i>Third Quarter</i>			
Expense, chief executive.....	\$ 73,843*	\$ 70,260*	\$ 3,583*
Expense, controller.....	316,186*	318,497*	2,311
Expense, personnel.....	170,251*	168,548*	1,703*
	<hr/> \$560,280*	<hr/> \$557,305*	<hr/> \$ 2,975*
<i>Fourth Quarter</i>			
Expense, chief executive.....	\$ 53,137	\$ 51,520	\$ 1,617*
Expense, controller.....	150,553	140,949	9,604*
Expense, personnel.....	111,545	112,658	1,113
	<hr/> \$315,235	<hr/> \$305,127	<hr/> \$ 10,108*

* Red.

The variations from the budget of other management expenses are shown in Table 66. The variations in this table are of a similar nature to those shown in the preceding table.

Analysis of Variations from Budget.—The several summaries of variations from the budget for the executives should be analyzed to show the districts in which variations occur. Such an analysis is shown for the expenses of the sales manager in Table 67. Such a summary shows the sales manager how much he exceeded or fell short of his

TABLE 67

THE MILEAGE TIRE COMPANY

Analysis of Variations from Budget—Expenses, Sales Manager, First Quarter, 1926.

<i>Group of States</i>	<i>Variations from Standard in Budget</i>	<i>Variations from Standard in Actual</i>	<i>Increase Decrease*</i>
I.....	\$105,640	\$114,790	\$ 9,150
II.....	80,350	89,873	9,523
III.....	56,900	60,986	4,086
IV.....	30,500	32,892	2,392
V.....	32,700	30,980	1,720*
VI.....	28,600	29,386	786
VII.....	15,750	16,845	1,095
VIII.....	15,000	14,722	278*
IX.....	7,907	8,021	114
X.....	3,120	3,959	839
	<hr/> \$376,467	<hr/> \$402,454	<hr/> \$25,987

*Red.

budget and the territories in which the variations occurred. The variations from the budget, as compiled by the company, cannot be analyzed further because the variations from the standard are a "dollar guess." The data, however, are of a highly valuable character because one of the aims of budgeting is to cause the dollar forecast to be attained in practice.

The dollar forecast in expenses may be made in as much detail as desired. An analysis of the variations between the budget and performance may then be carried to the several expense accounts. Such a procedure helps to control individual expense items and is a part of the company's budget procedure, though not shown herein.

Variations from Standard Expenses, Sales Manager.—One of the most important analyses of variations is that showing the causes of variations. This problem may be approached by analyzing first the secondary causes for variations—namely, units and prices. To know that expenses have varied from standard is not enough. If the causes are analyzed into price causes and unit causes for variation, something more definite is known about the variations.

Standards for each class of expense should be established for each major executive. These expenses or standards should be analyzed in as much detail as necessary to help place responsibility. If the standards be set on a yearly basis, the variations in the interim figures will have to be adjusted for the seasonal variation before it can be

known whether or not the variations are no more than should be expected. If the standards be set on a monthly basis and all the necessary computations made on that basis, then the summaries and the statements which show standard costs will vary, not only because of variations in quantities, but also because of price changes. Variations in standards due to seasonal variations appear to be more objectionable than having to adjust the variations from standard for seasonal variations. The chief reason is that varying the standard for the seasonal

TABLE 68
THE MILEAGE TIRE COMPANY
Analysis of Variations from Standard—Expenses
Sales Manager, First Quarter, 1926—Group I States

Expense Classification	Actual	Before Adjustment for Seasonal Variations		After ¹ Adjustment	
		Price	Quantity	Price	Quantity
Traveling expenses, salesmen.....	\$ 9,852	\$ 1,866	\$ 7,986	\$ 1,817	\$ 7,778
Traveling expenses, managers.....	4,386	602	3,784	586	3,686
Other traveling expenses.....	1,638		1,638		1,595
Salaries and bonuses, salesmen....	59,938	6,895	53,043	6,716	51,664
Salaries and bonuses, managers...	7,385		7,385		7,193
Commissions.....	4,965		4,965		4,835
Other compensation.....	695		695		677
Telephone and telegraph.....	887		887		864
Stationery and postage.....	1,324	186	1,138	181	1,108
Insurance and taxes.....	364		364		355
Samples, sales.....	1,980	240	1,740	234	1,695
Warehouse and shipping.....	14,860	2,805	12,055	2,732	11,742
Other office expenses.....	6,516	1,012	5,504	986	5,360
	<u>\$114,790</u>	<u>\$13,606</u>	<u>\$101,184</u>	<u>\$13,252</u>	<u>\$98,552</u>

¹ Seasonal variation for first quarter is 2.6 per cent.

factor is opposed to the concept of standard cost. If cost be stated at standard, then the data may be compared with any period during the year by taking account of the seasonal factor.

The analysis of variations from the standard expenses of the sales manager for the first quarter of 1926, for Group I states, is shown in Table 68. The variations are shown before adjustments for seasonal variations and after such adjustments. This summary is for all five states in the group. A separate analysis is made for each state and for the subdivisions thereof. Where the variations are significant, the data are analyzed according to individual salesmen, or other items.

Such an analysis reaches the primary points for determining causes for variations.

The seasonal variation in total shipments for Group I states is 20.3 per cent for the first quarter. The estimated expense necessary to do this percentage of the annual business is 22.9 per cent. This means that the sales management expenses are subject to a normal increase of 2.6 per cent due to the seasonal factor. The computations necessary to determine this factor cannot be included here. The general process was illustrated in Chapter XXIV.

CHAPTER XXXI

THE BUDGET

Review of Balance Sheet Variations.—A review of the accuracy attained in the performance of plans set may furnish considerable evidence as to the business ability of the administrators and executives of a business enterprise. Only so far, however, as this information may throw light upon future operations is it of any considerable aid to "management." The financial status of an enterprise will be different at some future date from what it is at the present time. Just how different it will be should depend upon the plans as set forth in the budget.

The diligent and consistent carrying out of budgets with a high degree of accuracy may be considered as perfection in execution. The budget as set forth by the administrators, however, may not require more than ordinary performance. The directors of the Mileage Tire Company, however, believe that they have set standards for the business which will result in their securing a rate of return consistent with present and with prospective conditions in the industry. The diligence and the consistency with which these plans have been carried out for the past may be of assistance in making plans for a future period.

A statement which sets forth the variations in the several balance sheet items may be of assistance in proving and in showing these variations. Such a balance sheet for each quarter of 1926 may be prepared from the balance sheets in Chapters XXV and XXVI. From such a statement of variations and from the budgets some comparisons may be made to show the degree of performance. Such computations are shown on page 440.

The most useful "management" information to be secured from accounting records of transpired events is a showing of plans and of performance and an appraisal of the probable causes for variations. Administrators and others must not lose sight of this and look upon the balance sheet of a past date as an instrument for the future guidance of the business. The balance sheet of the future will reflect

future conditions. If the balance sheet is to be projected into the future, these conditions must be foretold with reasonable accuracy. The enterprise should select balance sheet ratios which they consider desirable and see that the projected balance sheet meets with these standards.

<i>Items</i>	1926			
	<i>First Quarter</i>	<i>Second Quarter</i>	<i>Third Quarter</i>	<i>Fourth Quarter</i>
Cash and securities	\$27,368.9	\$27,482.1	\$41,248.8	\$40,915.7
Variances from budget	536.3*	410.6	5.3	364.7*
Per cent variation . . . . .	.01959*	.01494	.0001284	.008914*
Merchandise, goods in process, etc., budget	\$34,922.6	\$34,958.9	\$25,582.2	\$22,664.4
Variances from budget	577.	507.3*	157.9	462.5
Per cent variation . . . . .	.01652	.01451*	.00617	.020406
Total current assets	\$62,291.6	\$62,441.0	\$66,831.0	\$63,580.2
Variances from budget	40.8	96.7*	163.3	97.8
Per cent variation . . . . .	.000655	.001548*	.002443	.001538
Liabilities, budget	\$18,391.2	\$17,432.2	\$17,102.2	\$13,686.6
Variances from budget	54.8*	46.2*	29.0	206.3
Per cent variation . . . . .	.002979*	.00265*	.001695	.01507
Cash, budget	\$ 8,400.0	\$ 6,930.0	\$12,480.0	\$16,500.0
Variances from budget	28.9	38.3	207.9	13.5*
Per cent variation . . . . .	.003440	.005526	.016658	.0008181*
Accounts receivable	\$10,082.0	\$11,665.2	\$18,831.9	\$15,228.8
Variances from budget	561.1*	361.1	235.5*	349.8*
Per cent variation . . . . .	.05565*	.03095	.012505*	.022969*
Appropriated surplus	\$15,895.2	\$15,100.0	\$14,800.0	\$14,900.0
Variances from budget	90.0	14.2	14.2	85.8*
Per cent variation . . . . .	.005662	.0009404	.0009594	.005758
General reserves	\$ 8,700.0	\$ 8,000.0	\$ 8,300.0	\$ 9,500.0
Variances from budget	10.6	65.2	96.9	21.2
Per cent variation . . . . .	.001218	.00815	.01167	.002231
Free surplus	\$ 5,100.0	\$ 7,000.0	\$10,100.0	\$ 8,900.0
Variances from budget	2.9*	6.6*	39.9	20.6

Unit: Thousands of dollars.

* This means that performance fell short of the budget.

The degree of success obtained by the executive in meeting the budget requirements set for important phases of the profit and loss operating statement is shown in Table 69.

General Economic Conditions.—The external conditions should be given serious consideration before the data assembled to build the budget are given final form. This precaution is of more significance in some businesses than in others. It has been shown that the trend of unit sales of tires and tubes follows closely that of automobile

TABLE 69

MILEAGE TIRE COMPANY PERFORMANCE IN MEETING THE BUDGETS

<i>Items</i>	<i>1923</i>	<i>1924</i>	<i>1925</i>	<i>1926</i>
Sales in Units:				
3 months in advance..... +	1.95%	— 1.46%	+ .24%	— .78%
1 year in advance..... +	2.13	— 1.98	— .27	— .0190
5 years in advance..... +	3.44	+ 2.97	+ 2.35	+ 1.14
Sales in Dollars:				
3 months in advance..... +	1.78	— 1.25	+ .27	— .4868
1 year in advance..... +	2.04	— 1.34	— .24	+ .1871
5 years in advance..... +	3.76	+ 2.78	+ 2.45	+ 1.74
Procurement Budget, \$:				
3 months in advance..... +	1.70	— 1.1	+ .32	+ .2371
1 year in advance..... +	2.47	— 1.2	— .21	+ .3078
5 years in advance..... +	3.16	+ 2.9	+ 2.41	+ 1.1
Other Budgets, \$:				
3 months in advance..... +	2.32	+ 2.12	+ 1.62	+ 1.3658
1 year in advance..... +	1.10	— 1.02	+ 1.01	+ .3761
5 years in advance..... +	2.4	+ 2.3	+ 1.71	+ 1.21
Profits*				
3 months in advance..... —	\$98.3	+ \$48.2	— \$480.6	— \$598.4
1 year in advance..... +	75.8	+ 98.6	— 320.1	+ 31.1
5 years in advance..... +	3.6%	+ 3.2%	+ 3.0%	+ 2.6%

* The first two items in profits are given in thousands of dollars. The other items are percentage deviation from the budget.

registration, and that automobile registration moves in a "straight line." On the procurement side of the business, however, conditions are different. The price of the raw materials may change rapidly and result in significant variations. The Mileage Tire Company has taken definite steps to control the principal ill effects of these changes. Adequate arrangements have been made to insure a continuous supply of the proper quality and quantity of raw materials. The price of materials which enter into process is standardized for definite periods. Variations from this price are controlled by hedging operations.

Foretelling the Profit.—What will the profit be? This is a question for cool and deliberate thinking and planning. Facts and circumstances must be available in proper quantities before this question can be approached in a satisfactory manner. The large majority of business men today do not face the problem in this manner. To some business men, profits are a residuum—what is left "after" everything else is provided for. When competition becomes more effective (and it appears to be effective in some industries) those who do not put profits in the foreground may find that other claims leave no residuary.

The facts needed for foretelling profits are prospective income, costs and expenses, and the profits desired. The importance of using profits as the prime factor can scarcely be overemphasized. With this important question settled, ways and means may be devised to determine a harmonious relationship between the other factors so that the prime object may be secured.

After reviewing the present conditions and the probable conditions in the tire and tube industry for the next year, the administrators of the Mileage Tire Company believe that their former profits policy should not be changed. An interpretation of this policy for the year 1927 would indicate a profit of approximately \$9,000,000. The profit to be earned in the first quarter is about \$1,300,000, and the operations necessary to secure this profit are set forth below.

The Sales Estimate.—In Chapter XXV the sales of the enterprise were reviewed and a forecast of the sales for the first quarter of 1927, in units, was made. The next problem is the study of prices. Such a study was made for each class of tires and of tubes. Such a study involves a consideration of the profits policy of the concern, the cost to make and to sell the product, and the probable influences upon these factors of "competition." From these studies it appears that the general average price of each commodity will change but little from that of the prior period. The results of these studies are embodied in the budget and set forth in BB-1.

An estimate must be made to show the probable sales returns, and other deductions from sales. These data are shown in B-2 and B-3. Past experience with these items has proved of value in estimating future performance.

Standard Cost of Sales.—From cost studies and forecasts the standard cost of sales may be set. The standard cost of goods to be sold is shown in BB-4. The standard per unit cost of labor and direct materials is set at the same rates as those of the prior quarters. The overhead cost standard was increased slightly over last quarter, due to increased cost of improving the quality of a portion of the product, and to other minor causes.

The standard cost for marketing and for other management costs was not changed from last year. There was a slight revision of the component items but no change in the total. The standard cost for these items is shown in BB-5 and BB-6.

THE BUDGET

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Variations from Standard.—The several standards set for performance will not be achieved. It becomes necessary for adequate planning, therefore, to estimate the extent to which variations will occur. If the standards be set high, as compared to probable performance, the variations will become correspondingly large. It is important to know the probable causes for any variations which may occur. If these causes are known beforehand, executive action may

THE MILEAGE TIRE COMPANY

Estimated Profit and Loss Statement

EXHIBIT BB

Date of Estimate; December 28, 1926

<i>Items</i>	<i>Schedules</i>	<i>First Quarter 1927</i>
Gross sales.....	BB-1	\$33,790,767
Less: sales returns.....	BB-2	46,088
Net billings.....		\$33,744,679
Deductions from sales.....	BB-3	2,150,000
Net sales		\$31,594,679
Cost of sales.....	BB-4	20,449,263
Gross profit.....		\$11,145,416
Marketing costs.....	BB-5	\$ 5,381,939
Management costs.....	BB-6	3,168,888
Total.....		\$ 8,550,827
Standard operating profit.....		\$ 2,594,589
Variations from standard in:		
Cost of goods sold.....	BB-7	\$ 323,200*
Marketing expenses.....	BB-8	642,000*
Management expenses, other.....	BB-9	490,000*
Total.....		\$ 1,455,200*
Net operating profit.....		\$ 1,139,389
Other income.....		\$ 1,547,000
Other expenses.....		1,361,000
Net increase.....		\$ 186,000
Net income for period.....	To AA-9	\$ 1,325,389

* Red.

THE MILEAGE TIRE COMPANY

<i>Estimated Gross Sales</i>			BB-1
<i>Items, First Quarter, 1927</i>	<i>Units</i>	<i>Prices</i>	<i>Amount</i>
Balloon tires.....	1,083.3	\$14.6972	\$15,921,476
Balloon tubes.....	1,150.9	2.5187	2,898,771
To BB.....	4,458.5		\$33,790,767

<i>Estimated Sales Returns</i>			BB-2
<i>Items, First Quarter, 1927</i>	<i>Units</i>	<i>Prices</i>	<i>Amount</i>
Balloon tires.....	1,600	\$14.20	\$22,720
Balloon tubes.....	2,000	2.40	4,800
To BB.....			\$46,088

<i>Estimated Deductions from Sales</i>						BB-3
<i>Items, First Quarter, 1927</i>	<i>Total</i>	<i>Cord</i>		<i>Balloon</i>		
		<i>Tires</i>	<i>Tubes</i>	<i>Tires</i>	<i>Tubes</i>	
Allowances.....		\$65	\$ 16	\$ 170	\$ 20	
Adjustments.....		65	24	75	26	
Excise taxes.....		190	50	260	70	
Volume rebates.....		150	45	180	38	
Transportation.....		240	65	325	76	
To BB.....	\$2,150	\$710	\$200	\$1,010	\$230	

be taken to minimize them. This does not mean, however, that such variations may be eliminated during the period. It may take years to bring performance up to a "reasonable" standard.

The directors of the Mileage Tire Company do not believe that the standards which they recognize in their budget procedure should be impossible of attainment. These standards are set to create a desire for performance. They are revised quarterly, if necessary, to provide variation factors which will increase the operating efficiency of the concern. This may be done without in any way affecting relationships with employees. It does not result, for example, in paying the employees less money or call for more production than the terms for which the contract provides.

The profit and loss classifications BB-7, BB-8, and BB-9 provide for the chief general groupings of management where variations are recognized in the budget. These prospective variations must be analyzed to determine the nature of the variations which are expected to occur. Other details are necessary to complete the profit and loss budget. These are summarized in Exhibit BB.

THE BUDGET

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THE MILEAGE TIRE COMPANY

Estimated Cost of Goods Sold

BB-4

	Cord		Balloon	
	Tire	Tubes	Tires	Tubes
Units.....	927.2	1,297.1	1,083.3	1,150.9
Composite standard cost, per unit:				
Direct labor.....	\$1.0480	\$0.1250	\$1.1321	\$0.1586
Direct materials.....	5.0123	0.8900	6.7823	0.9986
Overhead.....	1.90914	0.2035	1.1285	0.3054
	<u>\$7,96944</u>	<u>\$1.2185</u>	<u>\$9.0429</u>	<u>\$1.4626</u>
Composite standard cost, amount:				
Direct labor.....	\$ 971,705	\$ 162,138	\$1,226,404	\$ 182,533
Direct materials.....	4,647,405	1,154,419	7,347,266	1,149,289
Overhead.....	1,770,155	263,960	1,222,504	351,485
To BB.....	<u>\$20,449,263</u>	<u>\$7,389,265</u>	<u>\$9,796,174</u>	<u>\$1,683,307</u>

THE MILEAGE TIRE COMPANY

Estimated Marketing Costs

BB-5

Organization Units	Units	Prices	Amount
Cost, sales manager.....		\$0.7281	\$3,245,943
Cost, publicity manager.....		0.2694	1,201,012
Cost, manager of marketing.....		0.2097	934,884
To BB.....	<u>4,458.2</u>	<u>\$1,2072</u>	<u>\$5,381,939</u>

THE MILEAGE TIRE COMPANY

Estimated Management Costs

BB-6

Organization Units	Units	Prices	Amount
Costs, chief executive.....		\$0.0834	\$ 371,814
Costs, manager of standards and records.....		0.3021	1,346,822
Costs, manager of personnel.....		0.3253	1,450,252
To BB.....	<u>4,458.2</u>	<u>\$0.7108</u>	<u>\$3,168,888</u>

THE MILEAGE TIRE COMPANY

Variances in Estimated Cost of Goods Sold

BB-7

Items, First Quarter, 1927.....	Total	Labor	Materials	Overhead
Budget.....	\$20,772,463	\$2,630,980	\$14,468,379	\$3,673,104
Standard cost.....	20,449,263	2,542,780	14,298,379	3,608,104
Variances to BB.....	<u>\$ 323,200</u>	<u>\$ 88,200</u>	<u>\$ 170,000</u>	<u>\$ 65,000</u>

THE MILEAGE TIRE COMPANY

Variances in Marketing Expense Budget

BB-8

<i>Expense Budget, First Quarter, 1927</i>	<i>Amount</i>
Sales manager.....	\$350,000
Publicity manager.....	152,000
Manager of marketing.....	140,000
	<hr/>
To BB.....	\$642,000
	<hr/>

THE MILEAGE TIRE COMPANY

Variances in Other Management Expenses

BB-9

<i>Expense Budget, First Quarter, 1927</i>	<i>Amount</i>
Chief executive.....	\$ 60,000
Manager of standards and records.....	210,000
Manager of personnel.....	220,000
	<hr/>
	\$490,000
	<hr/>

The Production Schedule.—An index of seasonal variation in production is shown in Chapter XXIV. Given a yearly amount of

TABLE 70
COMPUTATION OF NORMAL DEPRECIATION, 1927

<i>Organization</i>	<i>Asset Values</i>		<i>Machinery and Equipment</i>	<i>Moles, Cores, and Poles</i>	<i>Misc.</i>
	<i>Total</i>	<i>Buildings</i>			
Chief executive.....	\$ 125	\$ 100	\$ 25		
Controller.....	644	400	230		\$ 14
Manager of procurement...	45,800	12,500	30,800	\$2,400	100
Manager of marketing....	3,240	2,180	1,000		60
Manager of personnel.....	1,930	1,620	240		70
	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
	\$51,739	\$16,800	\$32,295	\$2,400	\$244

Unit: Thousands of Dollars

<i>Normal Depreciation*</i>					
Chief executive.....	\$ 7,250	\$ 3,500	\$ 3,750		
Controller.....	49,900	14,000	34,500		\$ 1,400
Manager of procurement...	4,628,500	437,500	3,696,000	\$480,000	15,000
Manager of marketing....	279,500	73,500	200,000		6,000
Manager of personnel	86,300	56,700	24,000		5,600
	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
	\$5,051,450	\$585,200	\$3,958,250	\$480,000	\$28,000

* For Rates Used, see page 378.

sales in units, this index of seasonal variation in production may be used to determine the manufacturing schedule, as illustrated below.

Items	Cord		Balloon	
	Tires	Tubes	Tires	Tubes
Anticipated yearly sales.....	4,692.1	6,333.4	5,734.7	6,365.5
Seasonal variation in production.....	25.31	25.31	20.85	20.59
Production, first quarter, 1927.....	1,215,200	1,602,983	1,195,684	1,310,656

The way in which this information fits into the operating plans is shown in AA-2.

Planning Depreciation Standards.—As indicated previously, the Mileage Tire Company plans to “earn” its depreciation during the course of the year. This can be done only when the total amount appears in the profit and loss statement. Recognition is taken also of the idleness costs. The computations necessary to determine the normal depreciation and the depreciation on used and on idle facilities are shown in Tables 70 and 71.

TABLE 71

THE MILEAGE TIRE COMPANY

Distribution of Normal Depreciation and Analysis of Used and of Idle Capacity

	Normal Capacity Units	Net Sales Units	Per cent	Normal Depreciation Amount %	
Items					
.....					
Balloon Tires:					
First quarter.....	1,100	1,081.7	98.3363	\$ 375,200	
Year, 1927.....	5,600	5,734.7		1,799,500	.313791
Balloon tubes:					
First quarter.....	1,400	1,148.9	82.0642	\$ 141,378	
Year, 1927.....	6,200	6,363.5		686,400	.107865
Total depreciation:					
First quarter.....	5,790			\$1,059,685	
Year, 1927.....	24,160			4,628,500	
		Depreciation on Used Capacity		Depreciation on Idle Facilities	
Items		Amount	Per Unit	Amount	Per Unit
First quarter, 1927					
.....					
Balloon tires.....	\$333,780		.308570	\$ 41,420	.005221
Balloon tubes.....	101,698		.088518	39,680	.019347
		<u>\$735,202</u>		<u>\$324,483</u>	

At March 31, 1927, the several inventory items will have certain amounts of depreciation charged into the accounts. In order to determine the amount of such depreciation, it is necessary to multiply the standard rates to be charged by the estimated number of units. The computations necessary to show such depreciation for finished goods and for tires and tubes in process are shown below:

DEPRECIATION IN FINISHED GOODS INVENTORY, MARCH 31, 1927

<i>Items</i>	<i>Units</i>	<i>Rate per Unit</i>	<i>Amount</i>
Balloon tires.....	330,400	\$0.308570	\$101,952
Balloon tubes.....	539,800	0.088518	47,782
			<hr/> \$380,551

DEPRECIATION IN GOODS IN PROCESS—TIRES AND TUBES

<i>Items</i>	<i>Units</i>	<i>Rate per Unit</i>	<i>Amount</i>
Balloon tires.....	280,000	\$0.1777	\$ 49,756
Balloon tubes.....	340,000	0.0605	20,570
			<hr/> \$108,746

The depreciation charges for non-manufacturing operations are shown in Table 72.

The methods used in reflecting the depreciation charges require further comment. Non-manufacturing depreciation is charged on a unit basis. The normal capacity is the estimated annual sales in units. The normal capacity for any quarter is one-fourth of the annual sales estimate. The estimated sales for any quarter when

TABLE 72
ANALYSIS OF DEPRECIATION, NON-MANUFACTURING

<i>Items</i>	<i>Year 1927</i>	<i>First Quarter</i>
Normal capacity (units).....	23,125,000	5,781,000
Estimated sales (units).....	23,125,000	4,458,000
Used capacity (per cent).....	100.00	77.1146
Normal depreciation (amount).....	\$ 422,950	\$ 81,535
Normal depreciation (per unit).....	.0182897	.0182897
Depreciation used capacity (amount).....	\$ 422,950	\$ 62,876
Depreciation idle capacity (unit).....		.0141040
Depreciation idle capacity (amount).....		\$ 19,059
Depreciation idle capacity (unit).....		.0041857

divided by the normal capacity will give the used capacity factor. Such a computation helps to stress the "wastes" of seasonal variations. In computing the unit cost for depreciation in manufacturing, the normal capacity is productive facilities. The estimated sales (not the estimated production) when divided by the normal capacity give the percentage of capacity used. This percentage is used to determine the used and the idle capacity per unit rate. This procedure again emphasizes the seasonal factor in sales which appears of more importance than to emphasize production. It is easy to compute the procurement depreciation, and this may be done in interpreting the forecast to the manufacturing executive.

The Balance Sheet Forecast.—The information furnished by the profit and loss forecast gives some of the most important data to be used in the balance sheet forecast. Additional information which relates chiefly to the balance sheet and to operations beyond the particular operating budget is needed. The extent to which inventories are to be extended or to be liquidated must be known. The facilities needed for plant expansion must be known as well as other additions to the assets. Studies should be conducted to determine the rate at which each class of asset items is converted into cash, together with the seasonal factor applicable to each class of items. Similar studies should be made to determine the characteristics of the various liabilities. The estimated balance sheet, as shown in Exhibit AA, was prepared to reflect the anticipated "financial" status of the Mileage Tire Company at March 31, 1927.

ACCOUNTING FOR EXECUTIVE CONTROL

THE MILEAGE TIRE COMPANY

Estimated Balance Sheet, March 31, 1927

EXHIBIT AA

*Date of Estimate: December 28, 1926**Assets**Current Assets:*

Cash, U. S. Government securities, and debts receivable:

Cash.....	\$ 14,459,394
Marketable U. S. securities.....	5,986,900
Notes, loans, and acceptances receivable.....	3,145,600
Accounts receivable, net.....	10,385,600

Sub-total.....	\$ 33,977,494
----------------	---------------

Merchandise, materials, and goods in process:

Finished goods.....	AA-2	\$ 9,139,696
Goods in process.....	AA-3	6,085,344
Materials and supplies.....	AA-4	7,880,000
Materials and supplies in transit.....	AA-5	9,080,000

Sub-total.....	\$ 32,185,040
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Total current assets.....	\$ 66,162,534
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Properties, plants, and securities:

Land.....	\$ 1,211,320
Buildings.....	15,950,000
Machinery and equipment.....	32,060,000
Moles, cores, and poles.....	2,315,000

Sub-total.....	\$ 51,711,320
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Less: reserve for depreciation.....	AA-6	14,997,875
-------------------------------------	------	------------

Net value.....	\$ 36,713,445
----------------	---------------

Prepaid, deferred and miscellaneous assets.....	AA-7	\$ 1,019,660
Good-will, patents, and trademarks.....		1

Sub-total.....	\$ 1,019,661
----------------	--------------

Total assets.....	\$103,895,640
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THE BUDGET

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Liabilities and Net Worth

Liabilities

Current Liabilities:

Notes, loans and acceptances payable.....	\$ 8,755,231
Accounts payable.....	6,186,400
Accrued pay roll.....	580,000
Accrued taxes and interest.....	360,000
Miscellaneous items payable.....	65,000
Provision for income tax.....	350,000
Total current liabilities.....	<u>\$ 16,296,631</u>

Net Worth:

Capital stock, common.....	\$ 30,000,000
Capital stock, preferred.....	25,504,000
Appropriated surplus.....	14,900,060
Free surplus.....	AA-9 8,749,090
General reserves.....	79,153,069
	AA-8 8,445,940
Total net worth and reserves.....	<u>\$ 87,599,009</u>
Grand total.....	<u>\$103,895,640</u>

THE MILEAGE TIRE COMPANY

Analysis of Finished Goods at Standard Cost

AA-2

Items:

Balloon Tires	Units	Prices	Amounts	Amounts	Prices	Units	Items
Initial inventory...	218,000	\$9.0429	\$ 1,971,352	\$ 9,796,173	\$9.0429	1,083,300	Sales
Finished goods....	1,195,700	9.0429	10,812,595	2,987,774	9.0429	330,400	Inv.
First Quarter.....	1,413,700		\$12,783,947	\$12,783,947		1,413,700	
Inventory, March 31, 1927:							
Balloon tires.....			\$ 2,987,774				
Balloon tubes.....			789,512	\$ 9,139,696			

Inventory of Goods in Process at March 31, 1927

AA-3

Tires and tubes in process:

Balloon tires.....	\$2,511,180
Balloon tubes.....	460,530
Total (from A-3-1).....	<u>\$4,236,290</u>
Other goods in process (from A-3-2).....	1,849,054
To AA.....	<u>\$6,085,344</u>

THE MILEAGE TIRE COMPANY

Analysis of Finished Goods at Standard Cost

AA-3-1

<i>Items:</i>							
<i>Balloon Tires</i>	<i>Units</i>	<i>Prices</i>	<i>Amounts</i>	<i>Amounts</i>	<i>Prices</i>	<i>Units</i>	<i>Items</i>
Initial inventory..	330,000	\$8 9600	\$ 2,956,800	\$10,812,596	\$9.0429	1,195,700	Finished
Processed.....	1,145,700	9.0485	10,366,976	2,511,180	8.9685	280,000	Inventory
First quarter. . .	1,475,700		\$13,323,776	\$13,323,776		1,475,700	
.....			

THE MILEAGE TIRE COMPANY

Standard Cost of Goods in Process

A-3-2

<i>Items, First Quarter, 1927</i>	<i>Total</i>	<i>Labor</i>	<i>Materials</i>	<i>Over-head</i>
Plystock.....	\$1,227,414	\$ 91,397	\$1,045,620	\$ 90,397
.....				
	<u>\$1,849,054</u>	<u>\$118,811</u>	<u>\$1,611,722</u>	<u>\$118,521</u>

THE MILEAGE TIRE COMPANY

Reserve for Depreciation

AA-6

Reserve for depreciation, Dec. 31, 1926 (estimated).....	\$13,680,000	
Depreciation in cost of goods sold.....	735,200	
Depreciation, idle plant facilities.....	324,483	
Depreciation, used capacity, non-manufacturing.....	62,876	
Depreciation, idle capacity, non-manufacturing.....	19,059	
Estimated depreciation in inventories, Dec. 31, 1926:		
Finished goods.....	\$200,000	
Tires and tubes in process.....	115,000	
Goods in process.....	10,000	
	<u>\$325,000</u>	
Estimated depreciation in inventories, Mar. 31, 1927:		
Finished goods.....	\$380,511	
Tires and tubes in process.....	108,746	
Goods in process.....	12,000	
	<u>\$501,257</u>	176,257

Reserve for depreciation, March 31, 1927. To AA..... \$14,997,875

Deferred, Prepaid, and Miscellaneous Assets

AA-7

Variations in finished goods.....	\$ 140,360
Variations in tires and tubes in process.....	112,600
Variations in goods in process.....	60,400
Other items.....	<u>706,300</u>
To AA.....	\$1,019,660

THE BUDGET

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THE MILEAGE TIRE COMPANY

General Reserves

AA-8

March 31,
1927

Reserve for fluctuation in the price of rubber.....	\$ 2,000,000	
Reserve for federal income taxes.....	2,180,940	
Reserve for uninsured risks.....	3,240,000	
Other reserves.....	1,025,000	
		<hr/>
To AA.....	\$ 8,445,940	

Analysis of Free Surplus

AA-9

Free surplus, Dec. 31, 1926 (estimated).....	\$8,940,000	
Earnings for first quarter, 1927.....	1,325,389	\$10,265,389
		<hr/>
Dividends paid, 7% preferred stock.....	446,320	
Dividends paid, 2% common stock.....	600,000	
Transferred to general reserve.....	470,000	1,516,320
		<hr/>
Free surplus, March 31, 1927 To AA.....		\$ 8,749,069

CHAPTER XXXII

CONCLUSION

Introduction.—The objectives of this book were stated at the end of Chapter II. In the chapters which have preceded the present chapter, the several objectives have been discussed. The present chapter will review these objectives briefly and will show how they fit into the administrative and management phases of the business.

A Concept of Accounting.—In Chapter II the various concepts of the function of accounting were stated. The function of financial accounting was shown to be the presentation of a balance sheet and a relative profit and loss statement. The function of retrospective cost accounting was set forth as the ascertainment of the "actual" cost of commodities. The principal function of standard cost was stated to be the ascertainment of a "reasonable cost" for commodities. The growth of ideas as to the function of accounting and how those who employed it could best serve management led to a differentiation between public and private accounting. It was shown that public accountants are limited as to the scope of their work, while private accountants are not so limited. Since the principal concepts of accounting are based primarily upon accounting from the public accountant's point of view, which is not in agreement with modern management principles, it was necessary to state a concept of accounting from the viewpoint of the private accountant, or the business enterprise.

The concept of accounting was stated as follows :

To bring the philosophy of accounting into agreement with the philosophy of management control it is necessary to state the accounts in terms of standards, accomplishments, and causes for variation. All of these should be in terms of a definite organization. Causes for variation should be properly analyzed and interpreted. Authority and responsibility should be placed and efficiency determined.¹

In order to make this concept of accounting effective, it was necessary to state that accounting is composed of (1) standards and records, and

¹ Chapter II, p. 27.

(2) ways and means for making the several branches of accounting effective.¹

The Objective of Standards.—A fundamental weakness of "historical accounting," from the viewpoint of administrative and management control, made it necessary to "discuss ways and means of setting up certain standards by which performance may be directed and appraised, and control of a business may be secured."² This weakness was found to exist because the performance of a past period is "no" criterion for what "should be" accomplished during a future period. In Chapter IV the necessity for standards as one means of control was emphasized by the illustration of the science of gun firing and the illustration of the manufacture of fans.

Accounting in Terms of Standards.—An objective of the present work was "to discuss ways and means for keeping accounts of certain business accomplishments in terms of standards."³ The principal phases of this work were treated in Part III, although the subject is treated in connection with the various phases of management and administration. It was stated that unless accounts be kept in terms of standards, it is difficult to interpret accounts for management and administrative uses.

Causes for Variation.—Two objectives of this treatise were:

- (a) To determine causes for variation between standards and actual accomplishment.
- (b) To analyze the causes for variation and interpret them so as to place effectively responsibility and authority for performance.⁴

Since performance will not usually be in agreement with standards, there will be variations between them. In Chapter IV it was indicated that the variations were to be accounted for in units, prices, and amounts, and that these "caused-causes" should be analyzed further to show the "causes" for variation. At many places throughout the treatise the determination of causes for variation has been dealt with and illustrated.

In a sizable business enterprise the effective placement of authority and responsibility is a difficult problem. An analysis of the causes for variation, when the accounts are kept in terms of an accountable organization, will do much to accomplish this important objective.

¹ Chapter IV, p. 54-55.

² Chapter II, p. 28.

³ Chapter II, p. 28.

⁴ *Ibid.*

Chapter IV indicates the necessity for standards and records which may be analyzed to show causes for variation between standard and performance. How the variations may be analyzed and interpreted to place responsibility effectively was treated in Chapters V and VI and in other chapters. For purposes of treatment, the analyses of variations and their interpretation, for the placement of authority and responsibility throughout the organization, were considered separately.

The Basis for Judging Efficiency.—Another objective of this treatise was “to show how efficiency may be effectively determined for management use.”¹ The basis for judging efficiency, for management control, was shown to be the relationship between standards and performance.² Throughout the treatise comparisons are made between standards and performance; adjustments are made to correct the standards and the variations are measured. The relationship between the adjusted standards and the variations serves as the basis for judging efficiency.

The Placement of Authority and Responsibility.—The last-mentioned objective of this treatise was “to discuss certain organization methods and procedure for the business enterprise, and to show how authority and responsibility may be effectively placed for purposes of control.”³ The basis for the placement of authority and responsibility was stated in Chapter III, and in Chapters IV, V, and VI. Briefly, authority and responsibility can be effectively placed, for purposes of control, only when the responsibility for accomplishment of results, which will compare favorably with standards, is accompanied by the power to get results. Records should be kept which will show definite information as to the progress of the work; definite information as to accomplishments; and the causes for success or for failure to secure the standards.

Profits the Primary Claim upon Consumers.—In Chapter X the question of profits was dealt with from the viewpoint of fair prices. The conclusion reached was that unless profits be considered as a first claim upon the consumers, “fair prices” are impossible. The principal reasons for this are: (1) that, under modern conditions, prices have to be “uniform” over a wide area; (2) that business is engaged in for profit, and where profits are not earned the shifting of the “capital” to some other industry results in a loss to consumers as well as to

¹ Chapter II, p. 28.

² Chapter V.

³ Chapter II, p. 28.

producers; (3) that prices are often set without a sufficient knowledge of the comparative cost of the commodities, which results in a loss to efficient producers; (4) that reasonable profits tend toward stability of prices and production.

Long-Term Policies.—While the policy corps are interested in policies as expressed in quarterly and semiannual budgets, their principal interest lies in the direction of long-term policies and the passing upon the effectiveness in the carrying out of those policies. In Chapter V the broader phases of the functions of the policy corps are treated. In the chapters which followed, however, it was observed that the policy corps are obliged to deal with many questions of appraisal of policies which required a thorough study of present, past, and short-term prospective policies. This study is necessary to appraise the work of the chief executive and to appraise the policies themselves.

Policy Control.—The control of policies may be effected by (1) analyses of changes and (2) analyses of variations from plan. Each of these points will be treated briefly.

The policy corps control broad policies chiefly by the analyses of various kinds of changes and proper action thereon. Some of these changes are due to economic conditions; styles or customs; discoveries and inventions; and social changes. Since most changes are not effected in a short time, provision should be made for them much in advance of the time when they will become effective. Every sizable concern is affected by changes of the character mentioned above. Unless these changes be watched carefully, the stockholders may discover that their investment is greatly impaired.

Another type of control which the policy corps use in the control of policies is that of the analyses of variations from plan or standard. A policy may be very profitable if performance can be kept close to a reasonable standard. If, however, variations of a significant character cannot be prevented, the policy may have to be abandoned. This type of control is applicable to a wide variety of subjects which is embodied in financial and profit standards. Three illustrations will assist in making this point clear. A manufacturer of silk stockings was forced to abandon his policy of replacing stockings which developed "runs," because it was impractical to keep the stockings up to the physical standards set. One case is of record where a manufacturer with a mass production policy was forced to abandon it because his selling costs varied widely from expectations. In another case, a sales policy of long standing, which held that the sales price must be

twice the average production cost, had to be abandoned because a reduction in production cost lowered prices and caused a substantial loss.

Instruments for Policy Control.—Since policies may be said to be established for the future guidance of the executives, the instruments used in the formulation of those policies must be designed to yield information about the future. Information as to the volume of business, costs, and prices is indispensable to wise policy making. Index numbers are valuable for this purpose. For purpose of emphasis, the following indices are mentioned:

1. Index numbers of the volume of business.
2. Index numbers of the volume of production and of productive capacity.
3. Index numbers of costs by major classifications.
4. Index numbers of sales prices.
5. Various indices of external conditions.

Each of these indices will be treated briefly.

An index of the volume of business should convey to the directors an idea not only as to the volume of business which the concern secures, but also the total volume of business in the industry and the trend of the volume of business. The position of the firm in the industry may be computed from these data. The trend or the rate of growth in the industry will show desirable facts which are indispensable to wise plant extension and general plant operations. When prices are rising, the directors will not be deceived into thinking that the volume of business is rising more than the facts warrant. The volume of business, taken in comparison with other pertinent economic data, will enable the policy corps to make an evaluation of the probable future demands upon the concern for products.

Indices should be available to show the status of production within the industry as well as within the business. These data, taken in conjunction with data on the productive capacity of plants within the industry, should make it possible for the concern to know the present operating condition of plants within the industry. This information should be of vital assistance to each policy corps in determining the possibility of overexpansion in the industry or of production in excess of requirements of the trade during a given period.

Index numbers of the various major classifications of cost should be made to show the trend of the various components of the sales

price. These indices should show separately the trend in profits, procurement costs, marketing costs, and the trend of variations from standards set. Comparative data as to the costs in other concerns should be available for purposes of comparison. Care must be exercised in the interpretation of these data and in the action taken upon evaluations. For example, the position of the firm in the industry may be such that the directors may feel that they should "get more business." The source from which the business is to be secured will have much to do with a prudent answer to this question. If the business is to be "taken" from competitors, the directors may well assure themselves that this can be done without unduly cutting down the profits margin. These data must always be considered in connection with other data, such as the volume and the price of the product.

Index numbers of sales prices are needed to show the past and the probable future trend in prices. These data should be studied without particular reference to the steps the company expects to take in the way of changing the trend of prices. This latter phase of prices will require a thorough study of all the indices mentioned under this topic. The general purposes of a lowering of price is to increase volume and thereby lower costs and raise profits. Whether or not this can be done is a problem which the directors must consider in the light of the many data which they are asked to interpret.

In addition to the various indices which are presented from information within the industry and the business, the directors must consider the indices of external conditions and make an appraisal as to their probable effects upon the industry. Some of the important indices which may be mentioned under this heading are as follows: the price of various commodities, the cost of living, the price of stocks and bonds, the interest rate, general business conditions, and conditions within the industry.

All of the data should be presented in graphic form so that comparisons and appraisals may be made without having to study the data in mass. Since the directors have to pass upon much data in the evaluation and formulation of policies, it is next to a physical impossibility for them to do this unless the data be presented through graphic charts. The several data may then be placed in proper perspective and the appraisal made with a minimum amount of effort.

The Relation of Profit Policies to Financial Control.—The profit policies of an enterprise should be formulated with an idea of securing and of maintaining an adequate financial control of the enter-

prise. The provision of ways and means by which adequate profits may be assured to a business is important to its continued existence. A fundamental knowledge of the factors involved is necessary before a satisfactory solution to the problem can be provided.

The profit requirements of any enterprise for the maintenance of proper financial control is more or less definite. Such requirements, however, vary widely in practice and undergo many changes. Unless the enterprise adjusts itself to these changing profit requirements, the control of its financial affairs may be jeopardized. Profit requirements are customarily stated as a percentage on its several classes of bonds and stocks. A financial policy which is based upon a fixed rate of return may result in a gain or a loss in purchasing power to the stockholder, depending upon whether or not the purchasing power of money rises or falls.

Return Necessary to Attract Investors.—The profit which a business enterprise earns must be sufficient to cause investors to be willing to purchase its securities on favorable terms to the business. In order for the concern to secure and to maintain a strong competitive condition, it should be able to secure "credit" on as favorable terms as its competitors. The dividends which a concern can pay, the earnings it can retain to use in the expansion of the business and to protect the capital investment, are important factors in attracting investors. This problem, however, is more adequately treated in Chapter VIII.

The Purchasing Power of Profits.—The purchasing power of money has been discussed widely. The wage earner has been appealed to strongly by "real wages" instead of "money wages" as a basis for compensation. The comparative purchasing power of profits, however, has received little attention. The recipient of profits has continued to think of his income as a percentage return upon his investment. If a concern has maintained an 8 per cent dividend for twenty years, the investor may think that this is quite a good record. During the twenty-year period, however, the purchasing power of money may have declined 50 per cent. In that event, this means that the "real dividends" of the concern have declined by one-half and that, compared to some former period, they are now only a fraction of what they were formerly.

From the viewpoint of the investor, purchasing power may be considered as (1) purchasing power for consumable commodities, and (2) purchasing power for investments. The investor who expects to use the income from his investments on which to live may measure his

income in terms of the cost of living. If he wishes to reinvest a large portion of his income, he may measure it in terms of the comparative prices of securities. In order to get a clear understanding of his economic position and the economic position of a concern, the investor must make a critical review of pertinent data. In addition to a point of view, the analyst requires certain tools, such as index numbers of various kinds and suitable charts. A starting point for such an analysis may be illustrated by the method used by Mr. Ernest F. DuBrul¹ in analyzing the operating statement of the United States Steel Corporation for the years 1902 to 1925 inclusive. His analysis shows that tonnage production has increased faster than deflated gross receipts; ² that deflated depreciation has not increased as fast as deflated gross receipts; that deflated wages have increased faster than production and faster than deflated gross receipts; that taxes have increased faster than wages, production, or gross receipts; that the trend of deflated net earnings is downward and not in keeping with the other factors analyzed.

One of the most important services which the controller and the properly trained private accountant can render to those interested in the corporation is to give the accounting data a broad economic interpretation. Emphasis should be placed upon the economic position of the concern as it relates to those who are interested in its progress. Such an analysis is often essential to adequate data on which to base a prudent profits policy.

Profits in Relation to Prices.—The degree to which the prices of commodities are stable usually depends upon a variety of facts and of circumstances. Some commodities have relatively fixed prices while the prices of others vary widely and continuously. Due to the complexity of the question it is often impossible to tell what relationship, if any, exists between profits and prices in an individual case. Price may be analyzed into a number of components; such as, profits, standard cost, variance cost, and other costs. A definite profits policy should be kept in the foreground. Such a policy, however, is the expression of an aim. It is not always possible to determine price by the use of an equation, though such a procedure should be established for the purpose of ascertaining the commodities to which the enterprise may most profitably devote its energies. Where competition dictates

¹ "Unintentional Falsification of Accounts," N. A. C. A. Bulletin, May 15, 1928.

² All dollars deflated on basis of 1913 prices equal 100.

prices that appear to yield no profits, or inadequate profits, the executives and the administrators should know the facts in order to appraise probable future results.

Interpretation of Profit Policies by Use of Ratios.—The use of ratios in the formulation of profit policies and their interpretation is not properly recognized by business men. A number of enterprises make extensive use of ratios in the interpretation of general profit and loss statements and balance sheets. The use of ratios in the daily operation of many phases of the business, however, appears very limited. The most generally recognized ratios which may be used in the analyses of financial statements are stated by J. H. Bliss¹ as follows:

1. Measures of earnings:
 - (a) The return earned on net worth.
 - (b) The ratio of surplus net profits to sales.
 - (c) Earnings on common stockholders' investments.
 - (d) Operating profits earned on total capital used.
 - (e) Ratio of operating profits to sales.
 - (f) Margin of gross profits earned on sales.
2. Measures of cost and expense:
 - (a) Ratios of costs and expenses to sales.
 - (b) The cost of borrowed capital.
 - (c) The cost of total capital used.
3. Turnovers:
 - (a) Turnover of total capital used.
 - (b) Turnover of inventories
 - (c) Turnover of accounts receivable.
 - (d) Turnover on fixed property investment.
4. Financial relationships:
 - (a) Net working capital and ratio.
 - (b) Manner in which capital is invested.
 - (c) Sources from which capital is secured.
 - (d) Proportion of earnings left in the business.

These ratios are most frequently used in connection with the general financial statements. Some of them may be used to advantage in the analysis of detailed operations. To illustrate: The turnover of inventories may be computed by commodities and classes of commodities. The ratio of operating profit to sales may be computed for individual items. If ratios be computed to show by individual items the components of cost to sales price, operating profits to sales, inventory turnover, assets used, and profits earned, the managers of an

¹ *Management Through Accounts*, p. 68.

enterprise may use this information to interpret the general profit policies of the enterprise, provided proper comparisons are made.

Comparisons are generally made for the purpose of interpretation. The importance of proper standards as a basis for comparison was stressed in Chapter IX. Unless care be exercised in making proper comparisons, the interpretation of results may be erroneous. For this reason profits policies can be administered best where the ratios are computed on a comparable basis with proper standards.

Another type of ratio which may be used in the formulation and the interpretation of profit policies may be called measures of operating efficiency. Such measures of efficiency should be computed for men, for machines, for materials, and for overhead expenses. Here again, care must be exercised to see that the ratios are computed on a comparable basis with proper standards. The interpretative work is then of a more scientific nature and less likely to be influenced by improper standards and by rule-of-thumb methods.

Analysis of Profit Policies by Products.—The study of individual products enables the policy corps to secure basic information on which to base rational profit policies. A definite use of accounting tools should be made for this purpose. The period for which the data are gathered should be sufficiently in advance of operations so that the results may be controlled. The directors of the Mileage Tire Company prefer to have studies made for quarterly and for yearly operations. By the use of charts the effects of changes during the interim may be reflected, if significant changes occur.

The estimated operations of the Mileage Tire Company for 1926 are shown in Chapter XXVI. An analysis of the per unit and some of the operating ratios are shown in Table 73. These operations are shown by lines of products. In the analysis of cost by lines of products it is necessary to determine the cost items which are applicable to individual items. Most of the marketing costs may be determined as applicable to individual products. Those costs which cannot be traced directly may be allocated by appropriate methods. The items which enter into other management costs should be traced to specific benefits, as far as possible, and the other items allocated by appropriate methods.

Where significant changes take place in a business from one year to the next, too much reliance cannot be placed upon past percentages to reflect future conditions. A true cost study must be made to determine what effects the changes will have upon the business. With increased sales of balloon tires and tubes came the elimination of fabric

TABLE 73
THE MILEAGE TIRE COMPANY
Per Unit and Percentage Data Based on 1926 Estimate.

<i>Per Unit</i>	<i>Cord</i>		<i>Balloon</i>	
	<i>Tires</i>	<i>Tubes</i>	<i>Tires</i>	<i>Tubes</i>
Net profit from operation.....	\$ 0.8026	\$0.0827	\$ 0.7694	\$0.1426
Variances from standard	0.0306*	0.0053*	0.0573*	0.0101*
Standard operating profit.....	0.8332	0.0880	0.8267	0.1527
Marketing cost.....	2.2017	0.4141	2.2257	0.4467
Management cost, other.....	1.3002	0.2412	1.2438	0.2630
Total.....	3.5019	0.6553	3.4695	0.7097
Gross profit.....	4.3351	0.7433	4.2962	0.8624
Cost of goods sold.....	8.0364	1.2693	9.2157	1.4878
Net sales.....	12.3715	2.0126	13.5119	2.3502
Gross sales.....	\$13.2526	\$2.1551	\$14.7439	\$2.5646
<i>Percentage</i>				
Net profit from operation.....	6.0547	3.8360	4.7665	5.5557
Variances from standard.....	0.2309*	0.2466*	0.3889*	0.3956*
Standard operating profit.....	6.2856	4.0826	5.1554	5.9513
Marketing cost.....	16.6097	19.2134	15.0954	17.4175
Management cost, other.....	9.8089	11.1934	8.8879	10.2551
Total.....	26.4186	30.4068	23.9833	27.6726
Gross profit.....	32.7042	34.4894	29.1387	33.6239
Cost of goods sold.....	60.6258	58.8999	62.5053	58.0141
Net sales.....	93.3300	93.3894	91.6440	91.6380
Gross sales.....	100.0000	100.0000	100.0000	100.0000

* Decrease.

casings and some of the tubes made especially for this tire. The trend in the sales of cord tires and tubes is to be altered. These changes indicate the necessity for cost studies to determine standards for the future accounting periods. Table 74 shows the forecast of profit by lines for the year 1927. This table shows as the first item the profits to be earned during the year. The amount of profit, however, can be determined only after a study of the factors which interact to cause profit.

CONCLUSION

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TABLE 74
THE MILEAGE TIRE COMPANY
Determination of Profits for 1927.

<i>Dollars</i>	<i>1927 Total</i>	<i>Cord</i>		<i>Balloon</i>	
		<i>Tires</i>	<i>Tubes</i>	<i>Tires</i>	<i>Tubes</i>
Net income for period....	\$ 9,150,064				
Other deductions, net....	293,174				
Net profit, operations....	\$ 9,443,238	\$ 3,727,874	\$ 538,339	\$ 4,349,770	\$ 827,255
Variances from standard..	534,269*	140,763*	31,667*	298,204*	63,635*
Standard operating profit.	\$ 9,977,507	\$ 3,868,637	\$ 570,006	\$ 4,647,974	\$ 890,890
Marketing cost.....	\$ 28,271,809	\$10,322,620	\$ 2,628,361	\$12,616,340	\$ 2,704,488
Management cost, other..	16,124,078	6,099,730	1,520,016	6,881,640	1,622,692
Total.....	\$ 44,395,887	\$16,422,350	\$ 4,148,377	\$19,497,980	\$ 4,327,180
Gross profit.....	\$ 54,373,394	\$20,290,987	\$ 4,718,383	\$24,145,954	\$ 5,218,070
Cost of goods sold.....	107,562,395	37,583,721	8,043,418	52,644,546	9,290,710
Net sales.....	\$161,935,789	\$57,874,708	\$12,761,801	\$76,790,500	\$14,508,780
Returns and deductions..	12,017,458	3,899,135	886,676	6,022,582	1,209,065
Gross sales.....	\$173,953,247	\$61,773,843	\$13,648,477	\$82,813,082	\$15,717,845
<i>Per Unit</i>					
Units.....		4,692,100	63,333,400	5,734,700	6,363,500
Net profit from operations.....	\$ 0,7945		\$0.0850	\$ 0.7585	\$0.1300
Variances from standard.....	0,0300*		0.0050*	0.0520*	0.0100*
Standard operating profit.....	0.8245		0.0900	0.8105	0.1400
Marketing cost.....	\$ 2.2000		\$0.4150	\$2.2000	\$0.4250
Management cost, other.....	1.3000		0.2400	1.2000	0.2550
Total.....	\$ 3.5000		\$0.6550	\$ 3.4000	\$0.6800
Gross profit.....	\$ 4.3245		\$0.7450	\$ 4.2105	\$0.8200
Cost of goods sold.....	8.0100		1.2700	9.1800	1.4600
Net sales.....	\$12.3345		\$2.0150	\$13.3905	\$2.2800
Returns and deductions.....	0.8310		0.1400	1.0502	0.1900
Gross sales.....	\$13.1665		\$2.1550	\$14.4407	\$2.4700
<i>Percentage</i>					
Net profit from operation.....	6.0348		3.9443	5.2525	5.6640
Variances from standard.....	0.2278*		0.2320*	0.3601*	0.0040*
Standard operating profit.....	6.2626		4.1763	5.6126	5.6680
Marketing cost.....	16.7103		19.2575	15.2347	17.2065
Management cost, other.....	9.8743		11.1369	8.3099	10.3239
Total.....	26.5846		30.3944	23.5446	27.5304
Gross profit.....	32.8472		34.5707	29.1572	33.1984
Cost of goods sold.....	60.8408		58.9327	63.5703	59.1093
Net sales.....	93.6880		93.5035	92.7275	92.3077
Returns and allowances.....	6.3120		6.4965	7.2725	7.6923
Gross sales.....	100.0000		100.0000	100.0000	100.0000

* Red.

A comparison of the per unit data shown in Tables 73 and 74 discloses that a price revision is anticipated for the year 1927. With the expansion in balloon tire and balloon tube sales a decline in price is expected. The data shown in Table 75, when compared with the data in Table 73, indicate that prices are to be lower in the first quarter of 1927 than they were for the year 1926. The anticipated decline for 1927 is not expected to take place during the first quarter. The formulation of and the interpretation of a profits ideal must be established by lines of products, but before such a policy should become

TABLE 75
THE MILEAGE TIRE COMPANY
Per Unit Data, First Quarter, 1927.

<i>Per Unit</i>	<i>Cord</i>		<i>Balloon</i>	
	<i>Tires</i>	<i>Tubes</i>	<i>Tires</i>	<i>Tubes</i>
Gross sales.....	\$13 1620	\$2.1330	\$14.6979	\$2 5190
Net sales.....	12.3799	1.9762	13 7446	2.3149
Cost of sales.....	7 9694	1.2185	9.0434	1.4627
Gross profit.....	4.4105	.7577	4.7012	.8522
Marketing cost.....	2.1297	.3660	2.2692	.4115
Management cost, other.....	1.2539	.2154	1.3373	.2423
Total.....	3.3836	.5814	3 6065	.6538
Standard operating profit.....	1.0269	.1763	1.0947	.1984
Variances from standard.....	.6084*	.0755*	.6508*	.0765*
Net profit from operation.....	\$ 0.4185	\$0.1008	\$ 0.4439	\$0 1219

* Red.

effective something must be known of the items which compose the several groups of products.

Unit Control of Individual Products.—The need for specific knowledge regarding the sales, procurement costs, marketing costs, other management costs, profits, inventory requirements, inventory turnover, and other data relating to specific kinds and sizes of products is not generally recognized. Detailed records are too often looked upon as “red tape” by managers who wish to “manage.” Records and reports which are accurate, immediate, and reliable can greatly assist a competent executive in doing his work better. Ways and means for providing the information necessary for unit control are important.

The best methods to be employed in many cases is a subject for research and study. In general, the question resolves itself into a study of quantity control and "records control."

Quantity control involves a definite knowledge of units on hand, the order point, the minimum quantity to order, units ordered, and units reserved to fill orders. It also involves a knowledge of seasonal requirements. A judicious use of executive forethought is necessary for an orderly planning of operations. Executive action must be provided to carry the plans into effective operation. Some kind of records and reports are needed to make these data available. Records control consists of the maintenance of records which are easily accessible and which provide pertinent information relating to goods of the concern. This information may be kept in units and amounts. The control of specific articles may be kept largely by the information provided for the control of units; however, the dollar items may be used in controlling individual products. The development of mechanical means for keeping records has made it practicable in many cases to maintain unit control over individual products.

The Mileage Tire Company maintains records for the unit control of individual sizes and kinds of tires and tubes. The data regarding the status of the inventory are available every day. These data are kept in units only. Records are kept which show the sales and standard procurement cost of each size and kind of tire and tube. At quarterly intervals studies are made of each size and kind of product for the evaluation of profits, standard procurement cost, standard marketing cost, standard management cost, deviations from standards set, and sales prices. The totals used in these studies do not agree with those developed in the general books because the study is one in merchandising and relates to a future period. An evaluation of past studies, however, indicates the deviations between the forecast and the performance, and evaluates the significant causes for variations.

Economic Lot Size Control.—The subject of unit control of individual products is closely related to the subject of the control of the economic lot size which may refer to procurement¹ or to sales. The unit of measure and the point of emphasis are the principal differences. The unit of measure in sales, for example, is not an individual unit but a service unit. A scientific study should be made to determine the

¹"Economic Manufacturing Lot Sizes," *Manufacturing Industries*, Vol. XV, p. 151. See also "Minimum-Cost Purchase Quantities," *Manufacturing Industries*, April, 1928, p. 310.

economic unit or units for the control of the activities of a business. A study of the service units and cost data of the Mileage Tire Company disclosed that much unprofitable effort had been expended because of a failure to recognize an economic lot size for sales. Tires and tubes were formerly priced to sell in larger quantities than they are now. This encouraged the customer to overbuy on one call of the salesman or to make few purchases until a large order could be placed. A study of the normal requirements of customers made it possible to change the unit of sales. The tubes, for example, of certain sizes are sold by the box. Prices are made so that it is advantageous to the customer to buy in lots. Tires are handled in a similar manner.

The study of customer requirements led to the following suggestions to customers: (a) what constitutes a model stock for the customer; (b) the quantity of each size and type to order; (c) the order point, and other specific information. From this study it was possible to plan the time for the call of the salesman so that an order of a specified size might be expected. The dealer is given an incentive to cooperate in the plan. Some dealers must place an order by mail to meet the minimum inventory which the company requires in the agency contract. Thus the company has not only greatly increased the size of the salesman's order, but it has taken steps to insure that the proper sizes and quantities of goods will be in the dealer's possession with which to fill orders as received. This practice has been partly instrumental in the stabilization of manufacturing activities.

Effect of Greater Output upon Price.—The progressive executive is interested in ways and means for keeping the plant capacity fully utilized.¹ He wishes to know what the unit procurement costs will probably be at various stages of capacity. He also wishes to know the probable marketing, other management, and other costs for specific classes of business. The policy corps must consider the same general problems in setting the goal for the management. The accountant who has the viewpoint of "management" is vitally interested in this problem and has much to contribute toward the making of policies and their interpretation.

The Mileage Tire Company, for example, has a sales forecast for 1927 which is about 9 per cent under the normal capacity. Normal capacity is referred to here as 80 per cent of the practical annual capacity. The directors of the company have never considered it a

¹ For a discussion of the "normal price," see articles in *Management and Administration* during 1924, by Donaldson Brown. See also Chapter XIII.

wise policy to bid for business of automobile manufacturers at a price much below the net price to agents. The question is raised as to the wisdom of this policy. Some concerns in the industry have shown an inclination to cut prices, and the question is raised as to how much the price could be cut by increasing production to normal capacity if the

TABLE 76

THE MILEAGE TIRE COMPANY

Estimated Cost of the Product Necessary to Obtain Normal Plant Capacity, and Price Reduction

Per Unit	Cord		Balloon	
	Tires 907,900	Tubes 426,000	Tires 266,300	Tubes 636,500
Net profit, operation.....	\$ 1.69	\$0 276	\$ 1.48	\$0 39
Variances from standard....	0.05*	0.01*	0.05*	0.01*
Standard operating profit....	\$ 1.74	\$0.286	\$ 1.53	\$0.40
Marketing cost.....	\$ 2.03	\$0.364	\$ 20.7	\$0.38
Management cost, other.....	.91	.180	.94	.17
Total.....	\$ 2.94	\$0.544	\$ 3 01	\$0 55
Gross profit.....	\$ 4.680	\$.830	\$ 4.54	\$.95
Cost of goods sold.....	7.654	1.185	8 85	1.33
Net sales.....	\$12.334	\$2.015	\$13.39	\$2.28
Gross sales.....	\$13.1665	\$2.1550	\$14.4407	\$2.4700
Gross sales (Table 74).....	\$61,773,843	\$13,648,477	\$82,813,082	\$15,717,845
Gross sales, additional.....	11,953,865	918,030	3,845,558	1,572,155
	\$73,727,708	\$14,566,507	\$86,658,640	\$17,290,000
Profit on additional units....	\$1,534,351	\$117,576	\$394,124	\$248,235
Percentage reduction.....	.0208	.008	.0047	.0143

* Red.

sales were made to dealers. In each case, the profits policy is to remain substantially the same.

The controller presents the estimates in Table 76. This table is result of the estimates of cost which would obtain if the additional sales were secured from dealers and the profit secured from this business used to lower the list price of the product. These results were secured from an appraisal of the fixed and the variable costs at the levels of production—namely, present production and normal production.

tion. In the case of the cost of goods sold, the savings in cost came as a result of the degree of variability of the overhead expenses. The same is true for marketing and for management cost. The computations shown at the foot of Table 76 indicate the price reduction which

TABLE 77
THE MILEAGE TIRE COMPANY

Estimated Cost, Profits and Price Reduction with Plant Operating at 90% of the Practical Capacity

Per Unit	Cord		Balloon	
	Tires	Tubes	Tires	Tubes
Units.....	700,000	840,000	750,000	875,000
Net profit from operation....	\$ 2.36	\$0.458	\$ 2.14	\$0.59
Variances from standard....	0.06*	0.010*	0.06*	0.01*
Standard operating profit....	\$ 2.42	\$0.468	\$ 2.20	\$0.60
Marketing cost.....	\$ 1.83	\$0.302	\$ 1.89	\$0.32
Management cost, other....	0.49	0.1000	0.52	0.08
Total.....	\$ 2.32	\$0.402	\$ 2.41	\$0.40
Gross profit.....	\$ 4.74	\$0.870	\$ 4.61	\$1.00
Cost of goods sold.....	\$ 7.59	\$1.14	\$ 8.78	\$1.28
Net sales.....	12.33	2.01	13.39	2.28
Gross sales.....	\$13.1665	\$2.1550	\$14.4407	\$2.4700
Gross sales (Table 76).....	\$73,727,708	\$14,566,507	\$86,658,640	\$17,290,000
Gross sales, additional.....	9,216,550	1,810,200	10,830,525	2,161,250
	\$82,944,258	\$16,376,707	\$97,489,165	\$19,451,250
Profit (Table 76).....	1,534,351	117,576	394,124	248,235
Profit, additional units.....	1,652,000	384,720	1,605,000	516,250
	3,186,351	502,296	1,999,124	764,48
Percentage reduction in price.	.038	.031	.021	.039

* Red.

could be made to secure the additional volume from dealers. Although the savings that could be effected through a larger volume are significant, the price reduction which could be made from the additional profits is small.

If the plant operations were increased so as to equal 90 per cent of the practical operating capacity, the additional cost and profits per

unit would be as indicated in Table 77. The decrease in overhead cost per unit is significant, but the total reduction in the list price is still comparatively small. These two sets of data indicate that the economies which result from a higher utilization of facilities of the company would not make it possible to lower prices appreciably without serious danger of loss. If the increased production were accompanied by a sizable reduction in the unit cost of labor or materials or both labor and materials, then the unused facilities might be used to strengthen the competitive condition of the concern and to increase its profits. In the absence of such a reduction in the fixed costs, the concern appears to have little to gain from the increase in volume for the purpose of lowering prices. Under the competitive system, the idle facilities may be used to punish competitors and for other purposes.

The data given above may be considered for the purpose of interpreting the policy of the concern with reference to "original equipment business" or contracts with automobile manufacturers. If this business be taken at "cost," the concern has something to gain from the sales that will be made to satisfied users of the original equipment. The probable value of this business may be ascertained from a research study. For the purposes of the present analysis, the value of this business is not considered. In pricing goods for an original equipment contract, a price may be made which will embody all the gains that will result from the use of the facilities which would be employed without the contract. This price need be little more than the cost of goods sold, shown in Tables 76 and 77, if a contract were taken for the units specified therein. The additional items which would have to be taken care of are as follows: cost variances, management costs, marketing costs, and interest costs. This would result in a significant reduction in price.

Profits policies are many and varied. To be most effective, profits policies should be appraised frequently. The tools for profits control mentioned above, while not intended to be exhaustive, may be used to appraise the effectiveness of policies and to discover desirable profits policies.

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V I T A

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